SPAROS SAT HD

DVB-S(2) FIELD ANALYZER

SPAROS SAT HD DVB-C

DVB-S(2) & DVB-C FIELD ANALYZER

SPAROS SAT HD DVB-T

DVB-S(2) & DVB-T FIELD ANALYZER

USER MANUAL

Thank you for purchasing this SPAUN product and therefore trusting our company. Our different teams (research department, production, sales department, after-sales service…) are aiming at satisfying your wishes by designing and updating very advanced appliances.

To obtain the best performance from this product please read this manual carefully.

For more information please contact our service:

Technical support :
e-mail: hotline@spaun.de
Phone : +49 (0) 7731-867318
Fax : +49 (0) 7731-867328

Website: www.spaun.com

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W A R R A N T Y

The company SPAUN electronic GmbH & Co.KG guarantees a two years warranty period for the Satellite Analyzer series SPAROS SAT HD .
The battery is excluded from this time period. For the battery we guarantee a 6 months warranty period. The invoice date is decisive for the warranty's commencement.
The warranty expires through opening the device and/or improper handling.

We refer to our terms of use in addition: http://www.spaun.com/pdf/spaun_agb_en.pdf

In case of a warranty defect, the device must be send at the following address. The customer bears the cost of shipping and is responsible for a sufficiently secure packaging! The customer bears the risk of accidental destruction or deterioration of the device during transport. Transfer of risk is the seat of SPAUN electronic GmbH & Co. KG in Singen.
SPAUN electronic may refuse to accept improper packaging.

SPAUN electronic GmbH & Co.KG
Service-Center
Byk-Gulden-Str. 22
D-78224 Singen
GERMANY

The company SPAUN electronic GmbH & Co. KG is not liable for any loss of data from users which have been stored in the device.

Specifications and design are subject to change due to our policy of continual technical improvement.

What to do in case of malfunction?

Please get in contact with the technical support of SPAUN electronic GmbH & Co.KG.
Please call +49 (0)7731 – 8673 – 18 for technical support or send an email to: hotline@spaun.de

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1 Important information

Please read cautiously the following instructions before using this appliance

1.1 Special precautions

- Do not use the product for any purpose else then scheduled.
- Use the battery charger provided to prevent any damage to the appliance and guarantee its measurement characteristics.
- Do not use in a wet environment.
- Do not use in an explosive environment.
- Only qualified personal should be allowed to work on the appliance in case of failure or for maintenance. In such a case, it is necessary to use SPAUN spare parts.
- Do not open the appliance: risk of electrical shock.
- You must use only the provided BNC/F convertor furnished with your appliance. Using any other convertor may damage your appliance and invalidates the guarantee.

1.2 Security instructions

For a good use of the appliance, you must respect the security and use instructions as described in this manual.

Some specific warnings are specified along this manual.

In case of need, warning symbols are stamped in the appliance:

1.3 Symbols and definitions

Symbols that appear in this user manual:

Remark: important information

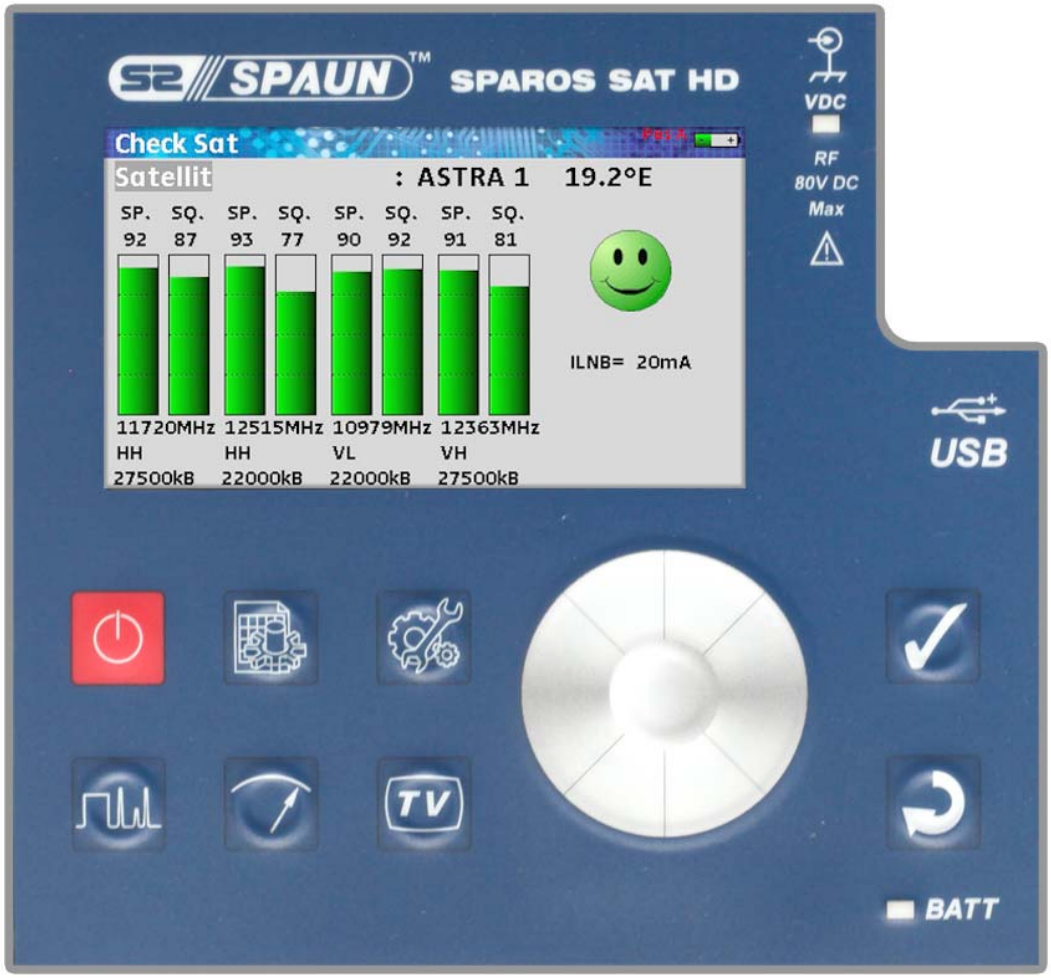
Symbols that appear on the appliance:

Caution: Refer to the user manual. Risk of damage to any material connected to the instrument or to the instrument itself.

Grounding: Easily reached parts linked to the grounding.

Product to recycle.

2 Quick start



Important keys:

Toolbox: For the set-up of the satellite remote supply

Spectrum: For fast identification of a signal

Measurement: For a fine adjustment of the parameters

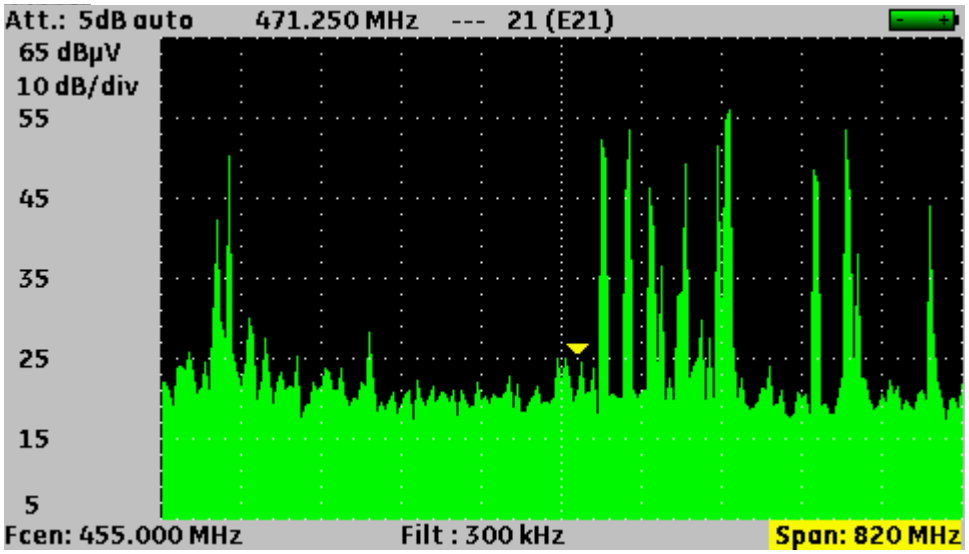
TV: For the complete validation of the reception

Validation: To select a value to modify

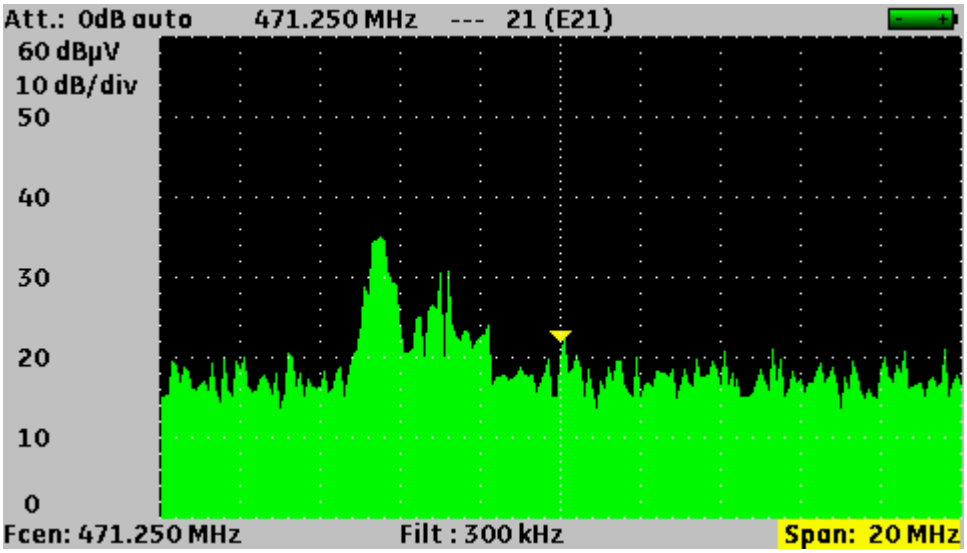
KNOB: To adjust this value

2.1 Catching of the terrestrial signal

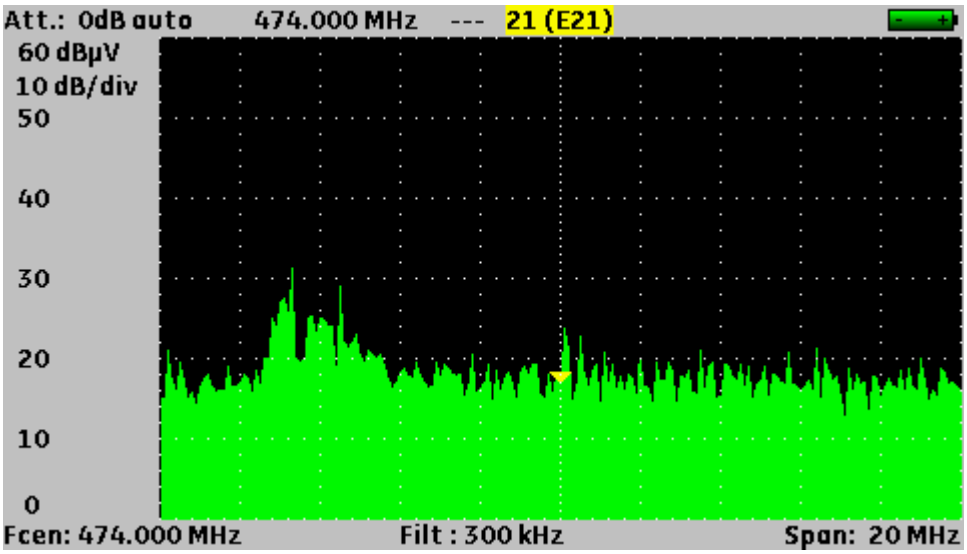
Push the Spectrum key



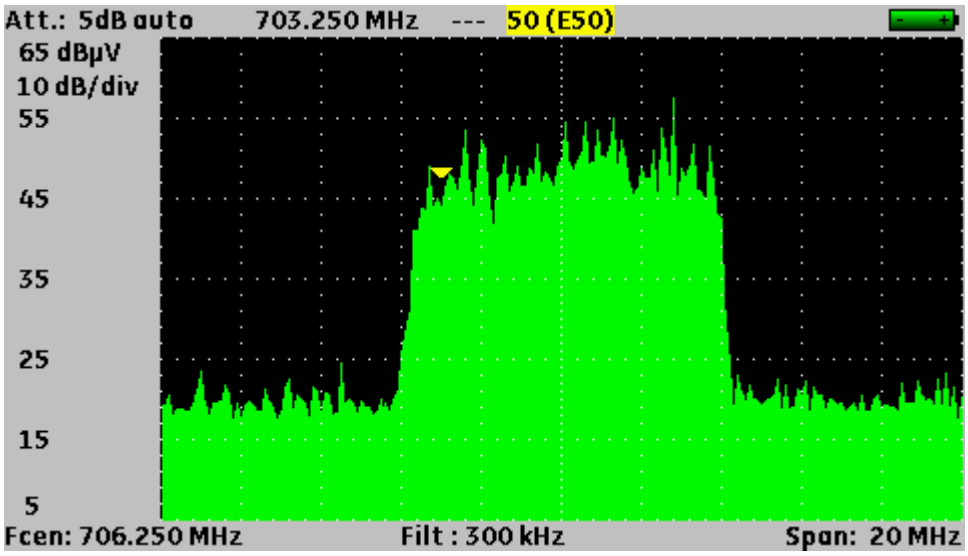
Push several times on the Validation key to select the Span: 820MHz parameter



Rotate the knob to display Span: 20 MHz



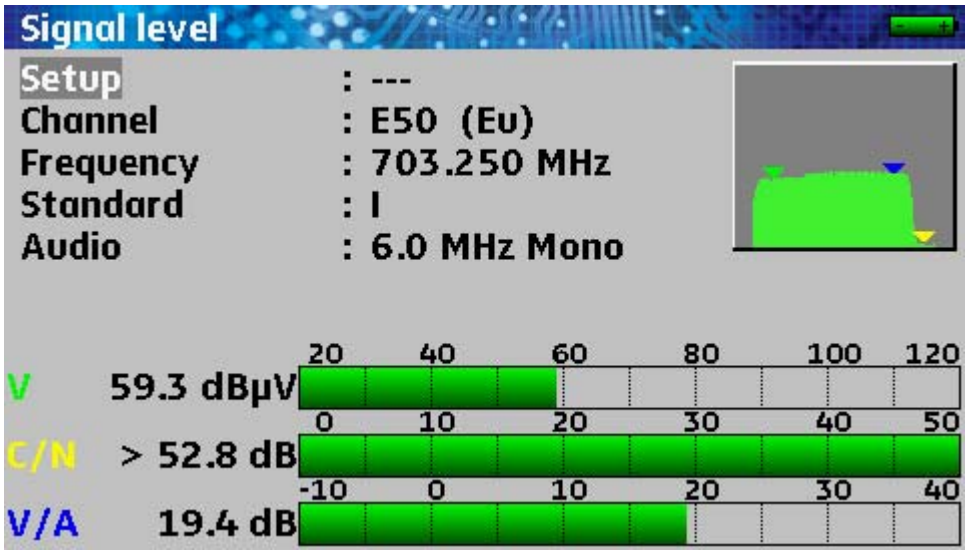
Push several times on the Validation key to select the Channel 21 (E21) parameter

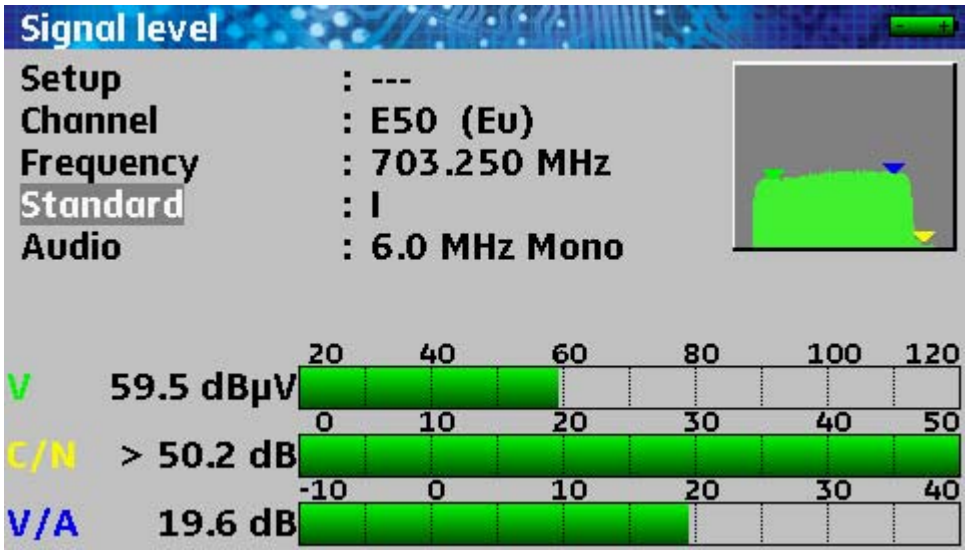


Rotate the knob to get an active channel in the 50 (E50) screen

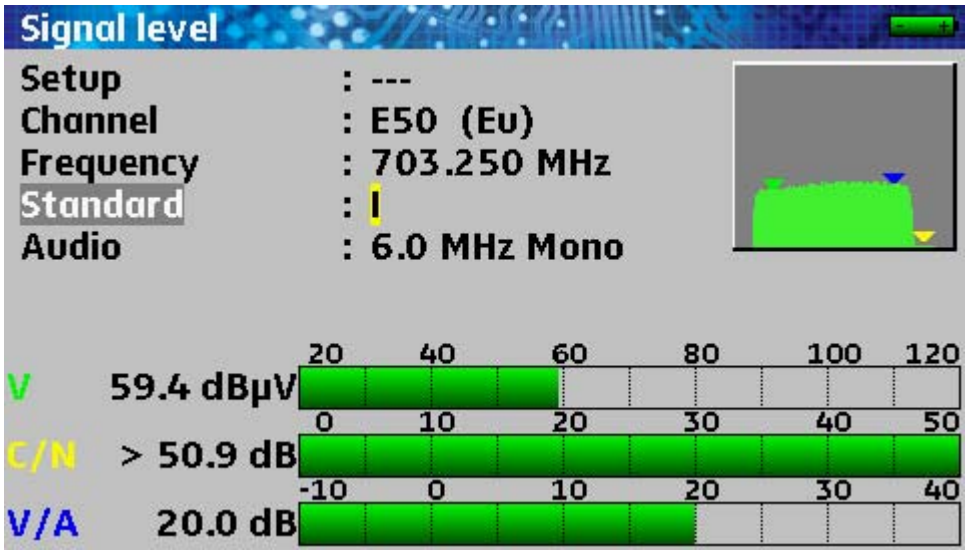
2.2 Adjustment of the parameters in the Measurement screen

Push the MEASUREMENT key

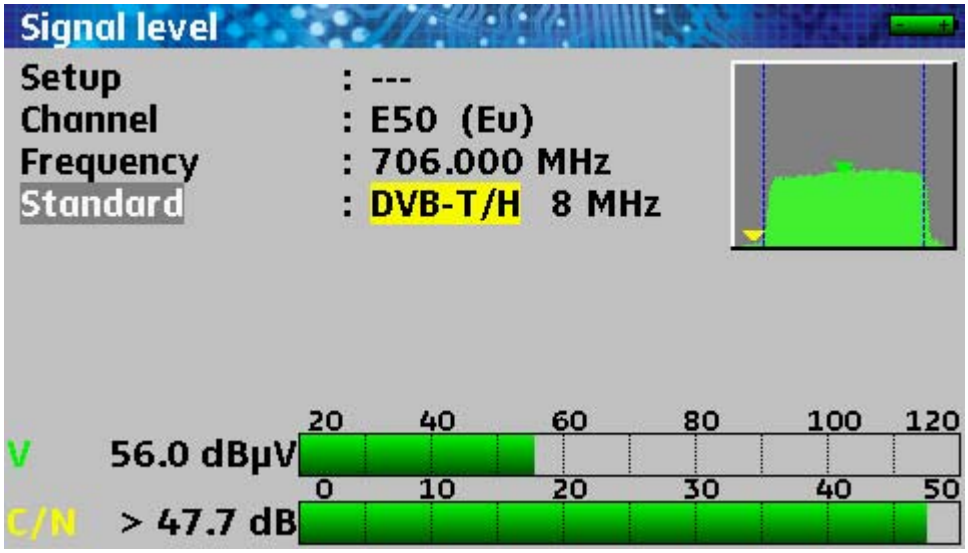




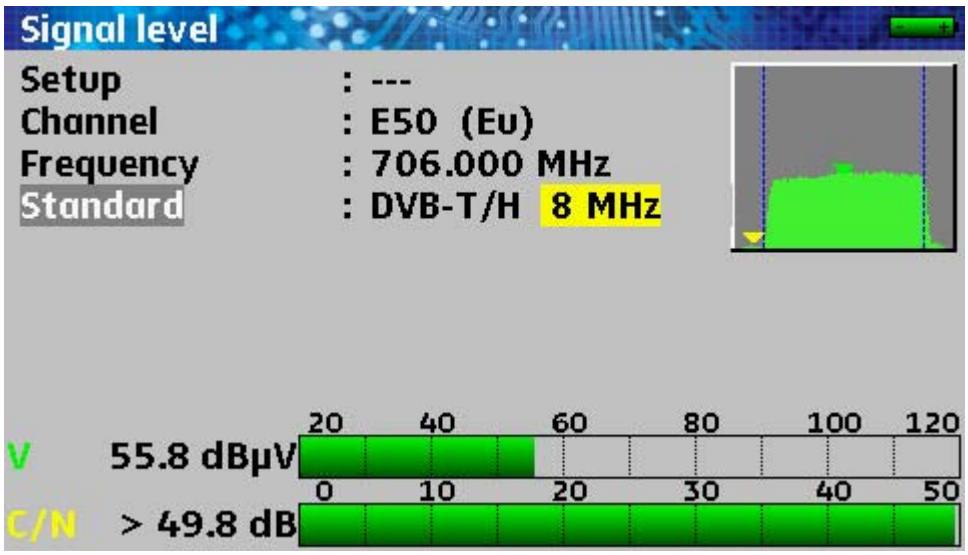
Rotate the knob to select the standard



Push the Validation key to select



Rotate the knob to modify the standard



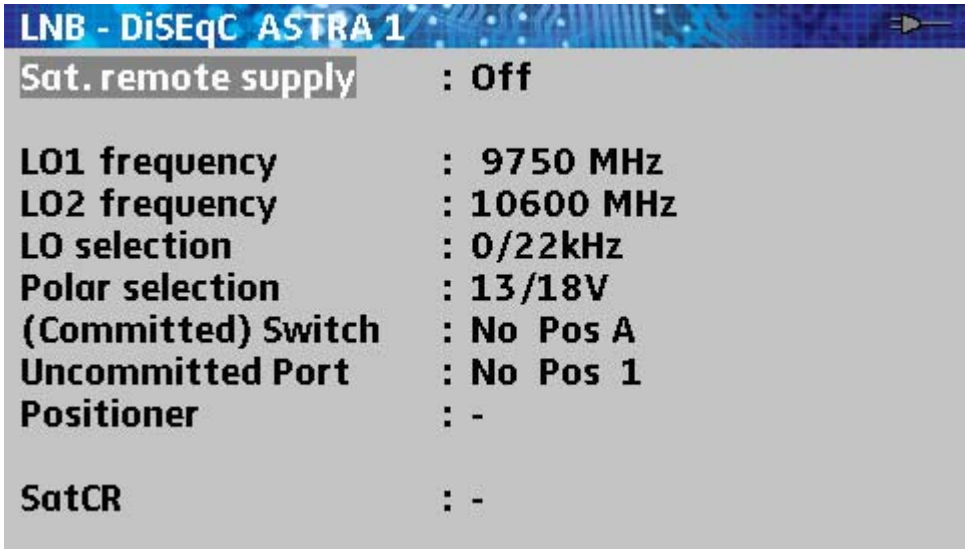
Push the Validation key to select the bandwidth

Rotate the knob for modification if required

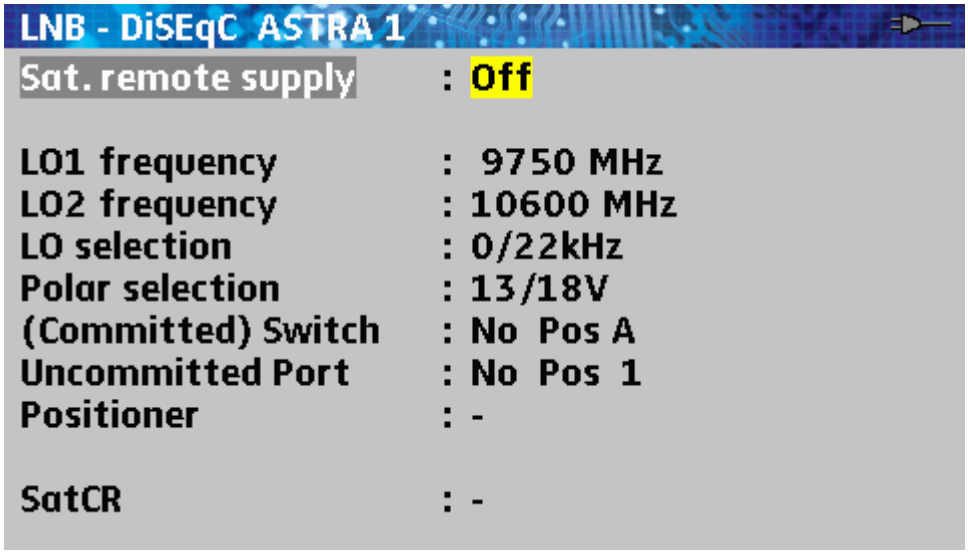
2.3 Validation on TV

Push on the TV key

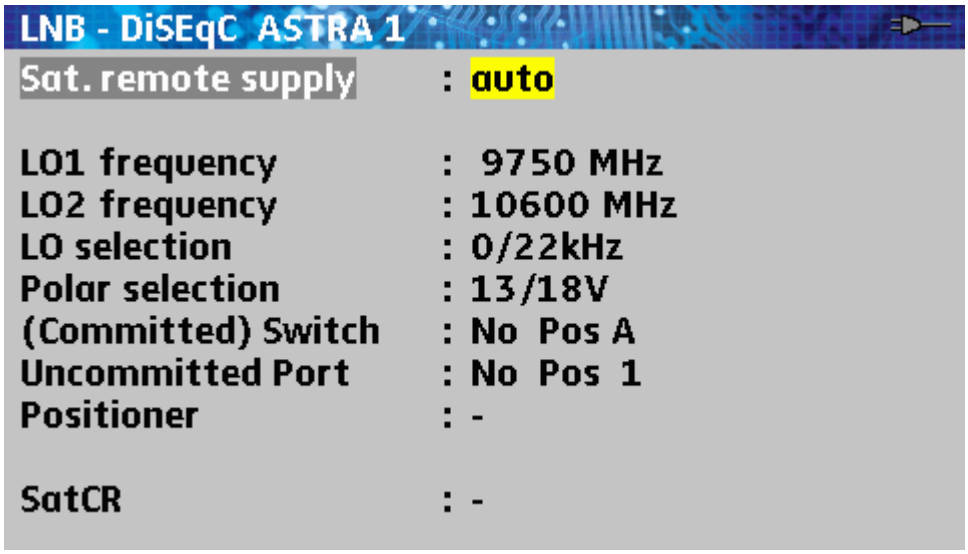
2.4 Set-up of the remote supply


LNB - DiSEqC ASTRA 1
Sat. remote supply : Off
LO1 frequency : 9750 MHz
LO2 frequency : 10600 MHz
LO selection : 0/22kHz
Polar selection : 13/18V
(Committed) Switch : No Pos A
Uncommitted Port : No Pos 1
Positioner : -
SatCR : -

Multiple push on the Toolbox key give you access to the Remote supply screen


LNB - DiSEqC ASTRA 1
Sat. remote supply : Off
LO1 frequency : 9750 MHz
LO2 frequency : 10600 MHz
LO selection : 0/22kHz
Polar selection : 13/18V
(Committed) Switch : No Pos A
Uncommitted Port : No Pos 1
Positioner : -
SatCR : -

Push the Validation key to select the Remote supply parameter


LNB - DiSEqC ASTRA 1
Sat. remote supply : auto
LO1 frequency : 9750 MHz
LO2 frequency : 10600 MHz
LO selection : 0/22kHz
Polar selection : 13/18V
(Committed) Switch : No Pos A
Uncommitted Port : No Pos 1
Positioner : -
SatCR : -

Rotate the knob to display On or auto

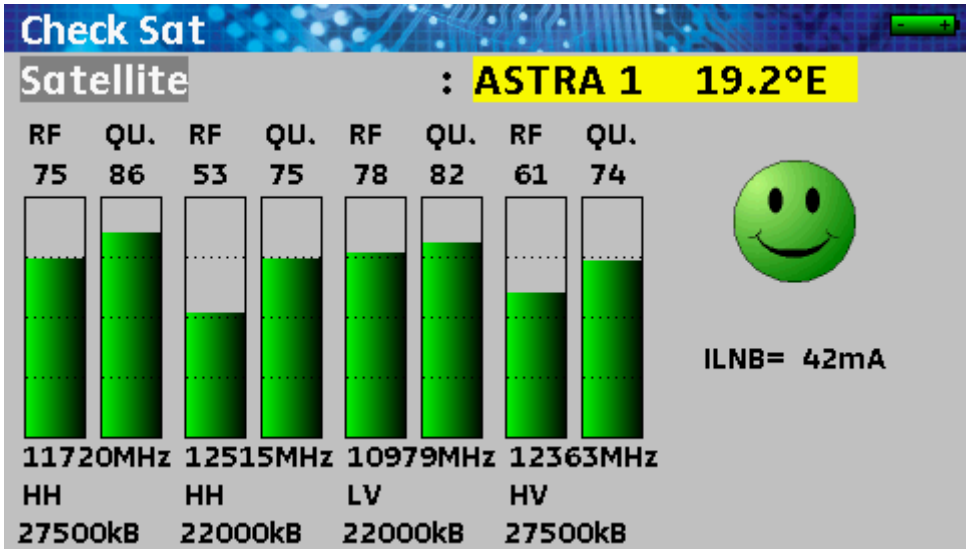
Push the Validation key

2.5 Dish adjustment

1/ Connect the dish to the appliance.

2/ Set up the remote supply (see Set-up of the remote supply)

3/ Push twice on the **Spectrum** key to access the pointing mode.
(The appliance already has a list of satellites included)


Check Sat
Satellite : ASTRA 1 19.2°E
RF QU. RF QU. RF QU. RF QU.
75 86 53 75 78 82 61 74
ILNB= 42mA
11720MHz 12515MHz 10979MHz 12363MHz
HH HH LV HV
27500kB 22000kB 22000kB 27500kB

4/ Choose the satellite to plot (see Pointing)

5/ Slowly direct the dish until you hear the locking signal and get the best quality.

No transponder found → red smiley

Medium reception quality (< 50%) → orange smiley

Good reception quality (> 50%) → green smiley

Remember: transponder = satellite channel

Caution:

To accurately identify a satellite, you have to « catch » it on all 4 transponders (Quality > 0)

However, some transponders are regularly modified. Consult the frequency plan of the satellite if the transponder does not seem to work.

Some switches or LNB only work with DiSEqC commands. In this case, set the band (OL) and the polarization on DiSEqC at the LNB-DiSEqC configuration page (Caution: the pointing is slower when you use the DiSEqC command).

3 Presentation

3.1 General

The field measurement appliances **SPAROS SAT HD, SPAROS SAT HD DVB-C and SPAROS SAT HD DVB-T** are portable appliances designed for the installation and the maintenance of any device for the broadcasting and reception of analogical, terrestrial digital, satellite television or cable network.

The frequency band ranges **from 5MHz to 2150MHz**; they allow accurate measurements on all standards of analogical televisions, the FM carrier waves and the various digital standards NICAM, DVB-C, MCNS, DVB-T/H, DVB-S, DSS and DVB-S2.

They make **Level** measurements as average measurements, peak measurements or power according to the selected standard, on the video carrier wave and the audio carrier waves if they exist.

In **Measurement Plan** mode, they scan up to 50 setups simultaneously and compare them to decision thresholds (min. / max.)

With their effective measurement of **Error rate** (various BER, MER); they enable the complete validation of the digital transmissions DVB-T/H, DVB-C, MCNS, DVB-S, DSS, and DVB-S2.

The graphic display of the **Constellation** in DVB-T/H, DVB-C, MCNS, DVB-S, DSS and DVB-S2 and the display of echoes in DVB-T/H allow the fulfilment of this analysis.

The quick and accurate **Spectrum** analysis shows the interference waves...

You can visualize the unencrypted image of **terrestrial digital or satellite TV** in SD and HD.

You can hear digital sound with an incorporated loudspeaker.

The large amount of FLASH memory allows the storage of many measurements and spectrum curves.

Designed for a use on field, they are compact (less than 1.5kg, battery included), unattended (pack battery and quick charger), equipped with a back lighted colour LCD display for a better visibility.

The capabilities of your appliance are summed-up in the table on the next page.

SPAROS SAT HD:

- **Satellite compatible**
- **Compatible with terrestrial signal**
- **Analogical and digital measurements**
- **DVB-S, DVB-S2 and DSS**
- **unencrypted SD/HD digital images and sounds**
- **13/18 Volt remote supply, ToneBurst, DiSEqC 1.0 / 1.1 / 1.2 and SatCR**

SPAROS SAT HD DVB-C:

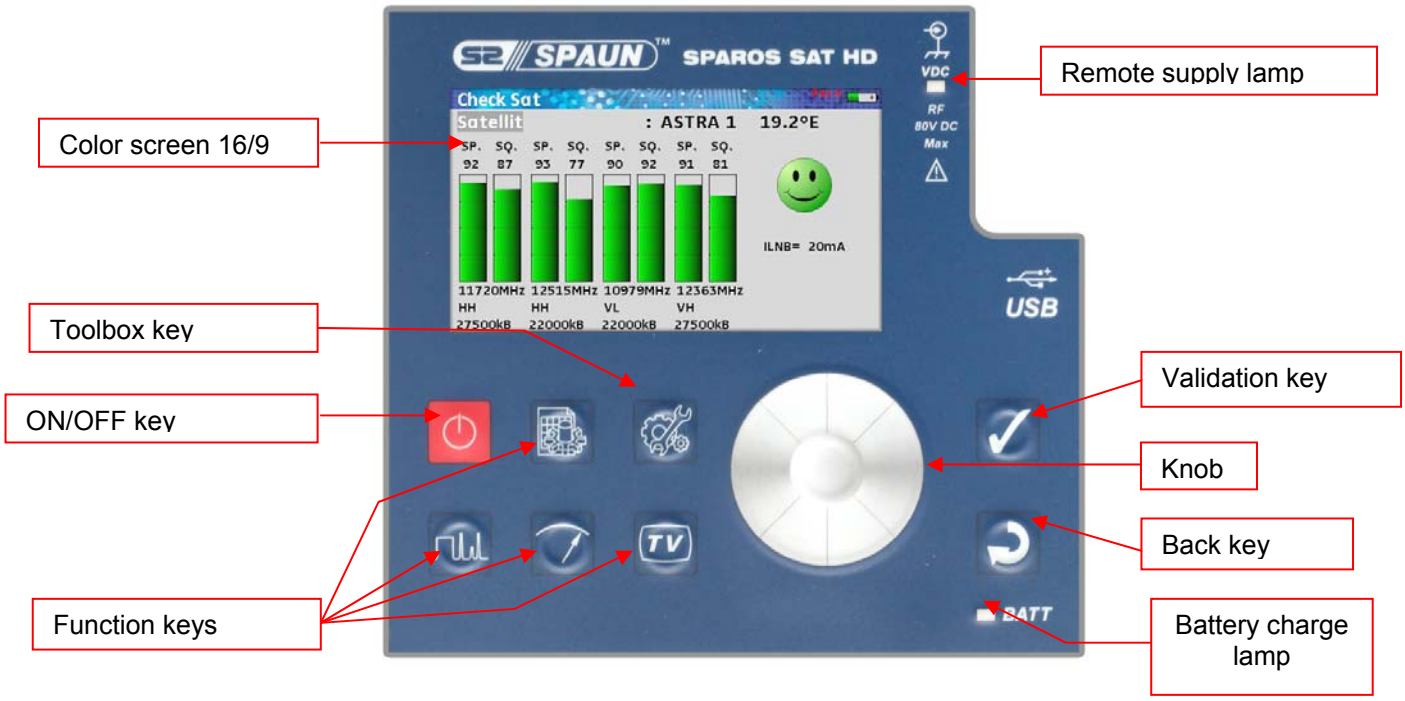
- **Satellite compatible**
- **Cable compatible**
- **Analogical and digital measurements**
- **DVB-S, DVB-S2, DSS, DVB-C, and MCNS**
- **unencrypted SD/HD digital images and sounds**
- **13/18 Volt remote supply, ToneBurst, DiSEqC 1.0 / 1.1 / 1.2 and SatCR**
- **5, 13, 18 and 24Volt remote supply**

SPAROS SAT HD DVB-T:

- **Satellite compatible**
- **Terrestrial compatible**
- **Analogical and digital measurements**
- **DVB-S, DVB-S2, DSS and DVB-T/H**
- **unencrypted SD/HD digital images and sounds**
- **13/18Volt remote supply, ToneBurst, DiSEqC 1.2 and SatCR**
- **5, 13, 18 and 24Volt remote supply**

3.2 Description

3.2.1 Front side



3.2.2 ON/OFF key

This key turns the appliance on and off.

The appliance will stop automatically after ten minutes on the splash page.

If the appliance gets locked, push it about ten seconds to stop it.

3.2.3 Function keys

PARAMETERS: selection and change of the measurement lists; pushing it twice gives you access to the library of the 1000 software listings available and to their modification

SPECTRUM: spectrum analysis; pushing it twice gives you access to the satellite adjustment mode; pushing it three times gives you access to the display of the identification of the satellite (according to the type of the appliance).

MEASUREMENT: level measurement (peak, average and power)

Pushing twice: measurement of BER and MER (according to the selected standard)

Pushing three times: display of the satellite constellation (according to the selected standard)

Pushing four times: display of the echoes (according to the selected standard and the type of the appliance)

Pushing five times: display of the measurement plan

TV: display of the digital image; the knob enables you to set the sound volume

Pushing twice: display of the list of services

Pushing three times: display of the pending setup

3.2.4 Toolbox key

According to the context, this key gives you access to secondary functions of the appliance.

If no parameter has been selected (yellow colour) and a measurement or a spectrum is displayed, it gives you access to the storage of this measurement or this spectrum.

Pushing it twice gives you access to the remote supply.

Pushing it three times gives you access to the configuration of the appliance

If a parameter has been selected, this key can give you access to a list of selections.

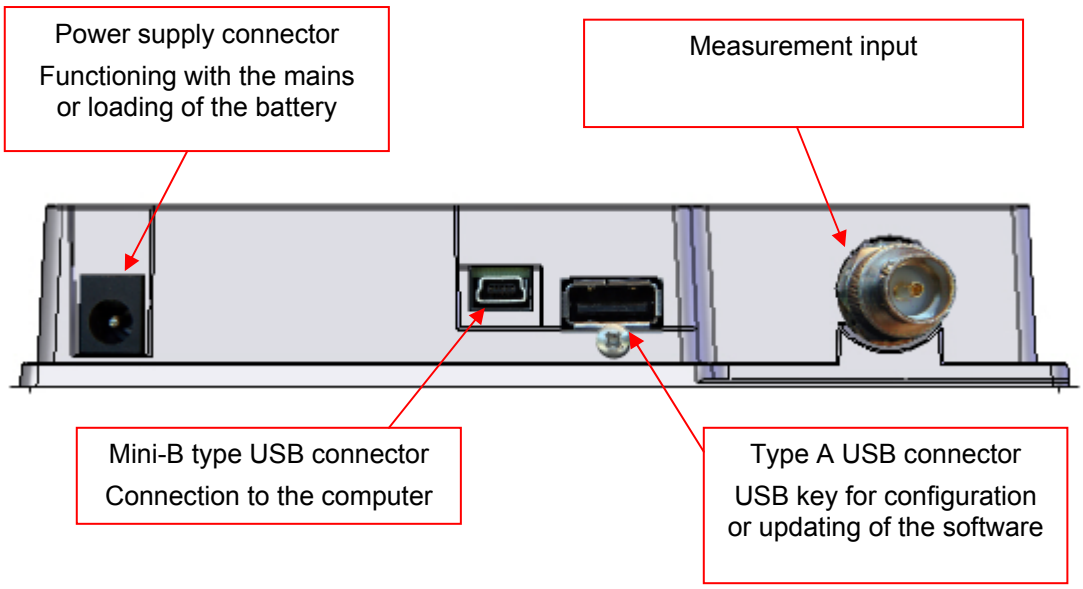
3.2.5 Validation and Back keys

Validation: this key enables the selection of parameters and the validation of your choice

Back: this key enables the de-selection of parameters, the cancellation of a choice and the closing of a list.

3.2.6 Connectors

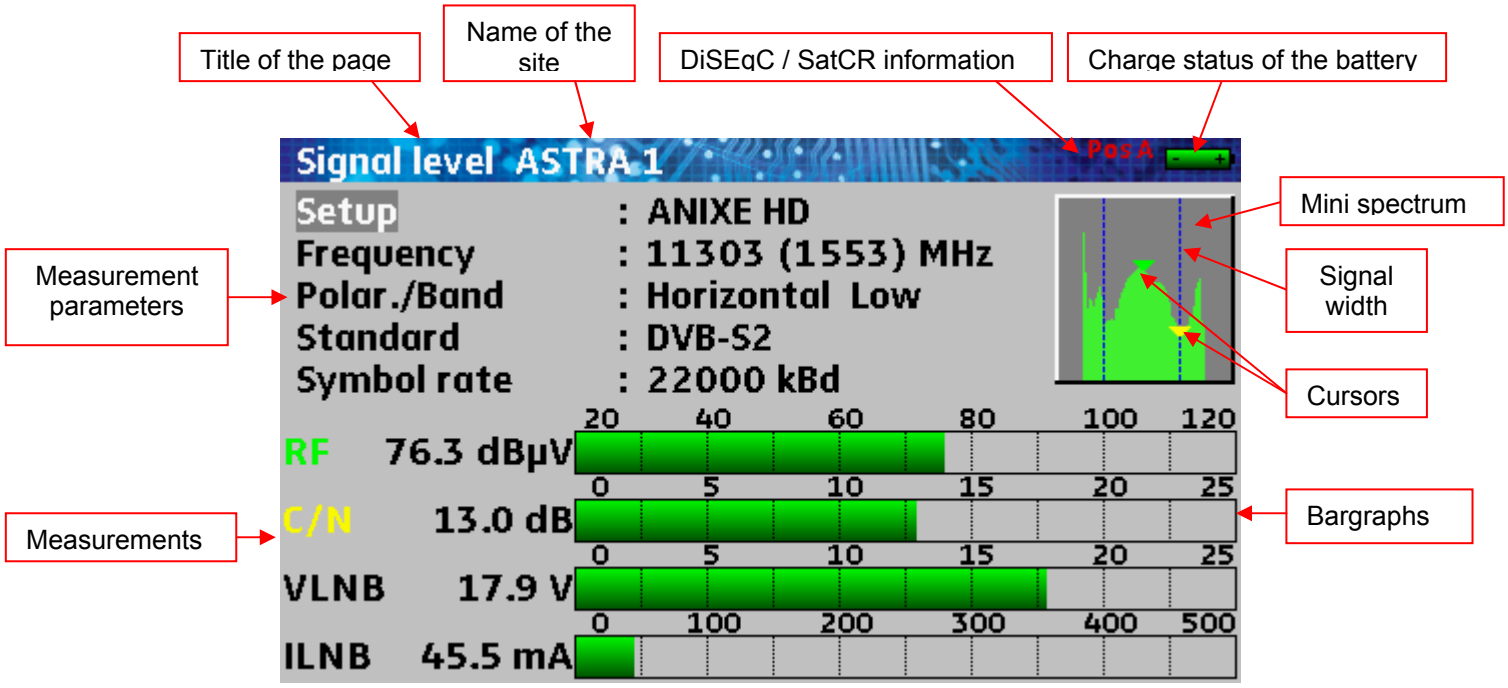
All connectors are located together on the right side of the appliance.


Power supply connector
Functioning with the mains or loading of the battery
Measurement input
Mini-B type USB connector
Connection to the computer
Type A USB connector
USB key for configuration or updating of the software

3.2.7 Contents of the screen

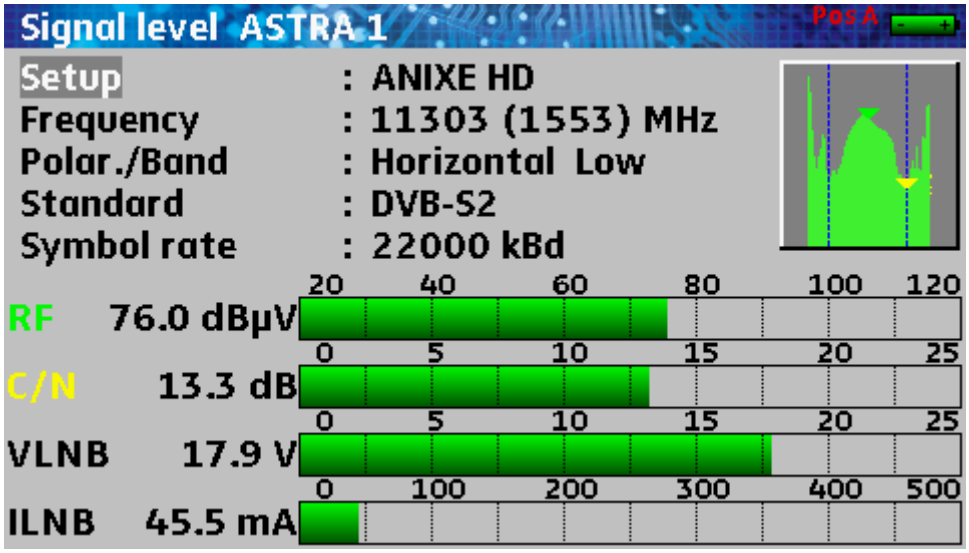
All useful information is gathered on the same screen.

Example: Measurement of the level-power of the satellite.



3.2.8 Man-machine interface

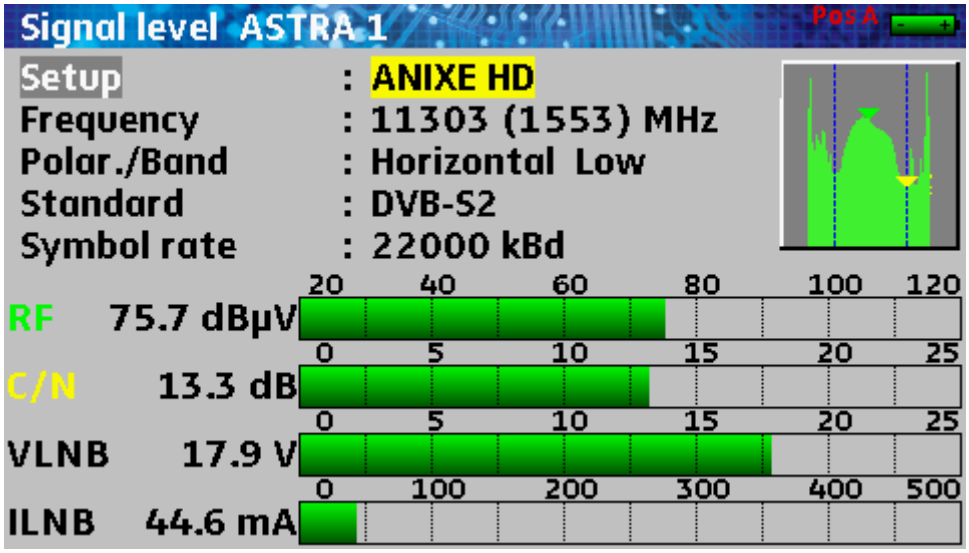
3.2.8.1 Modification of a parameter with the knob



Push the Measurement key

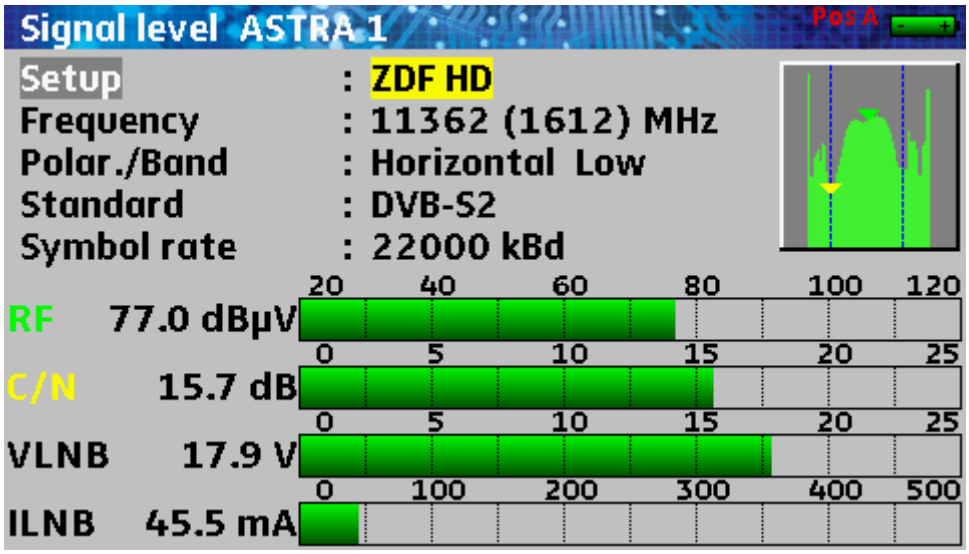
The Measurement page appears

With the knob, select the Setup line (**white on grey**)

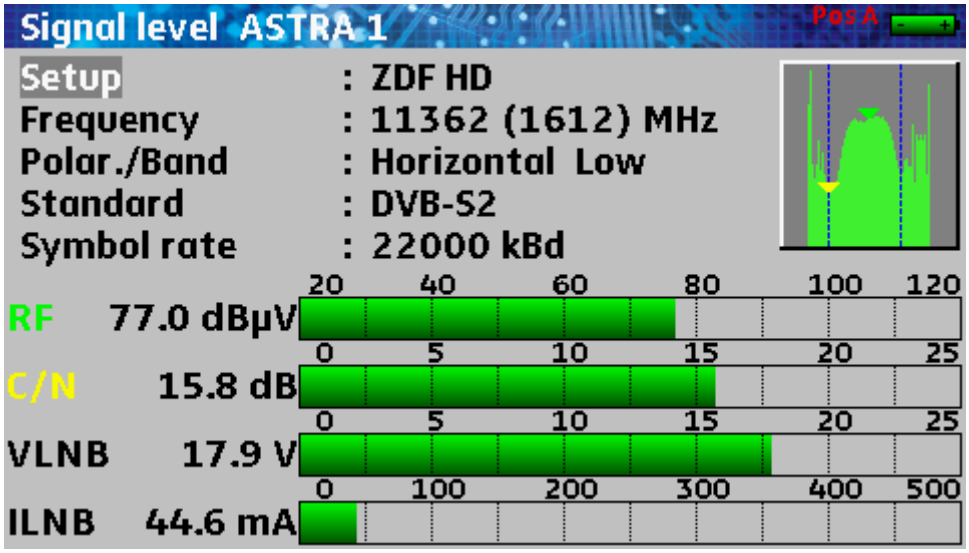


Push the Validation key

The name of the setup is selected (**black on yellow**): now you can change it



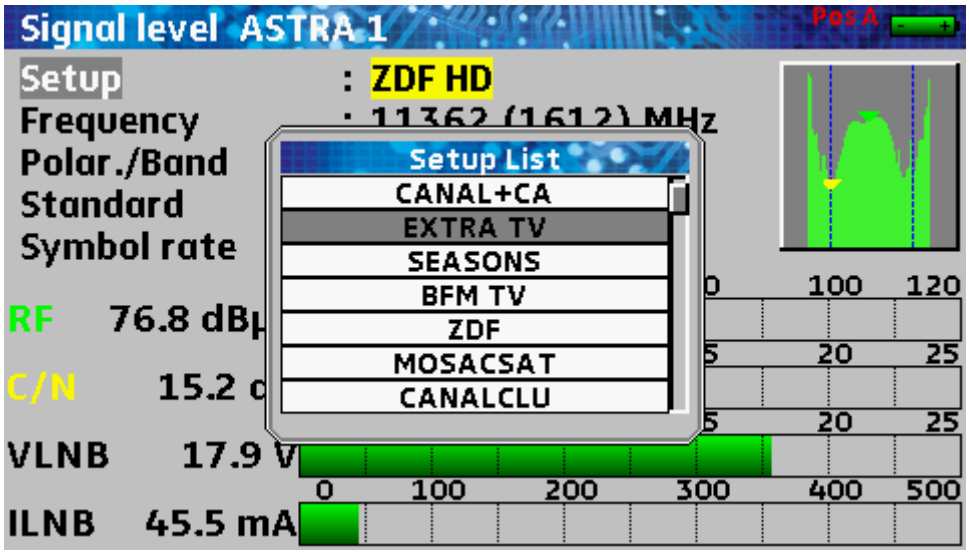
Rotate the knob to change the name of the setup; the parameters of the new setup are automatically recalled



Push the Back key

The name of the setup is no more selected; turning the knob will change the line but no more the setup

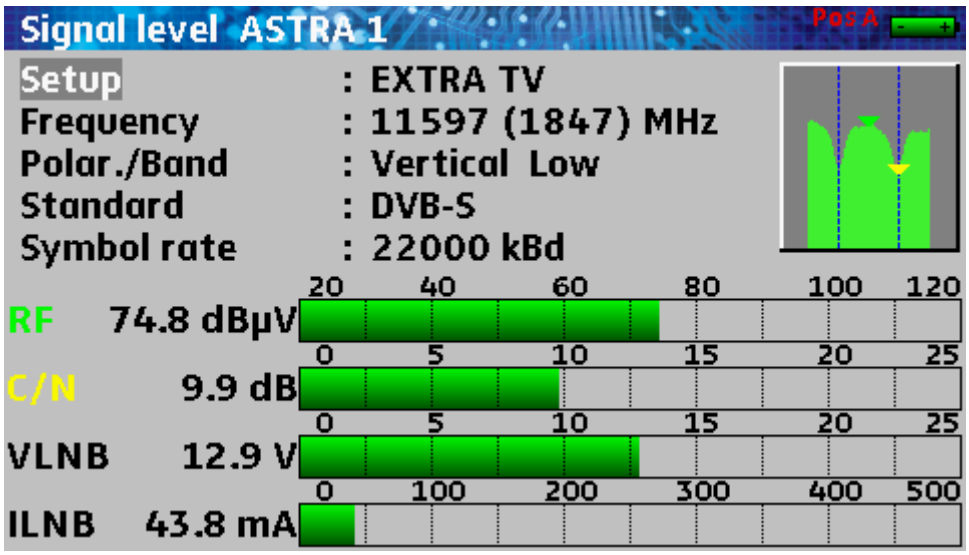
3.2.8.2 Modification of a parameter with a list



Push the Validation key,

then push the Toolbox key

The list of the available setups appears.

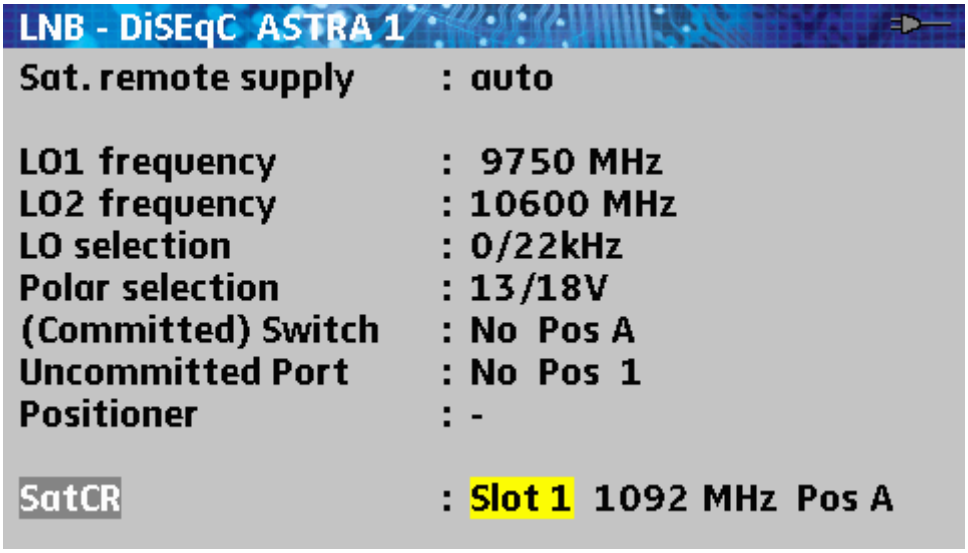


The knob enables you to move along the list

Push the Validation key

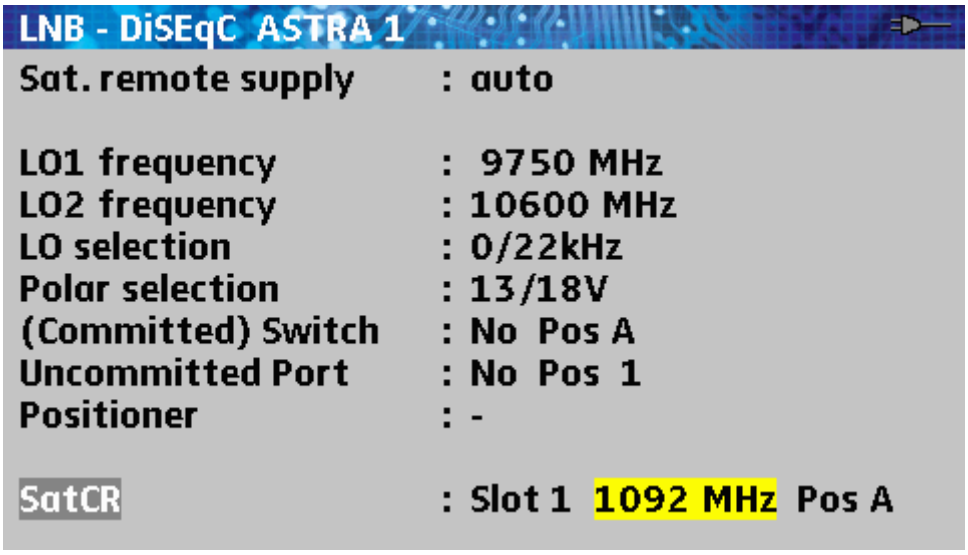
The setup is recalled, the name of the setup is no more selected

3.2.8.3 Line with several parameters


LNB - DiSEqC ASTRA 1
Sat. remote supply : auto
LO1 frequency : 9750 MHz
LO2 frequency : 10600 MHz
LO selection : 0/22kHz
Polar selection : 13/18V
(Committed) Switch : No Pos A
Uncommitted Port : No Pos 1
Positioner : -
SatCR : Slot 1 1092 MHz Pos A

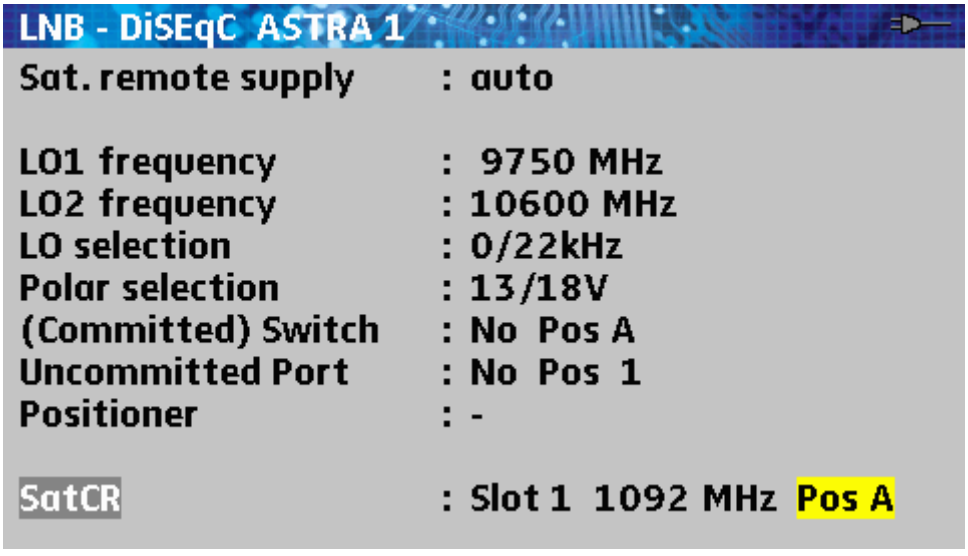
Push the Validation key

The first parameter is selected; you can change it with the knob.


LNB - DiSEqC ASTRA 1
Sat. remote supply : auto
LO1 frequency : 9750 MHz
LO2 frequency : 10600 MHz
LO selection : 0/22kHz
Polar selection : 13/18V
(Committed) Switch : No Pos A
Uncommitted Port : No Pos 1
Positioner : -
SatCR : Slot 1 1092 MHz Pos A

Push the Validation key once again

The second parameter is selected; you can change it with the knob.


LNB - DiSEqC ASTRA 1
Sat. remote supply : auto
LO1 frequency : 9750 MHz
LO2 frequency : 10600 MHz
LO selection : 0/22kHz
Polar selection : 13/18V
(Committed) Switch : No Pos A
Uncommitted Port : No Pos 1
Positioner : -
SatCR : Slot 1 1092 MHz Pos A

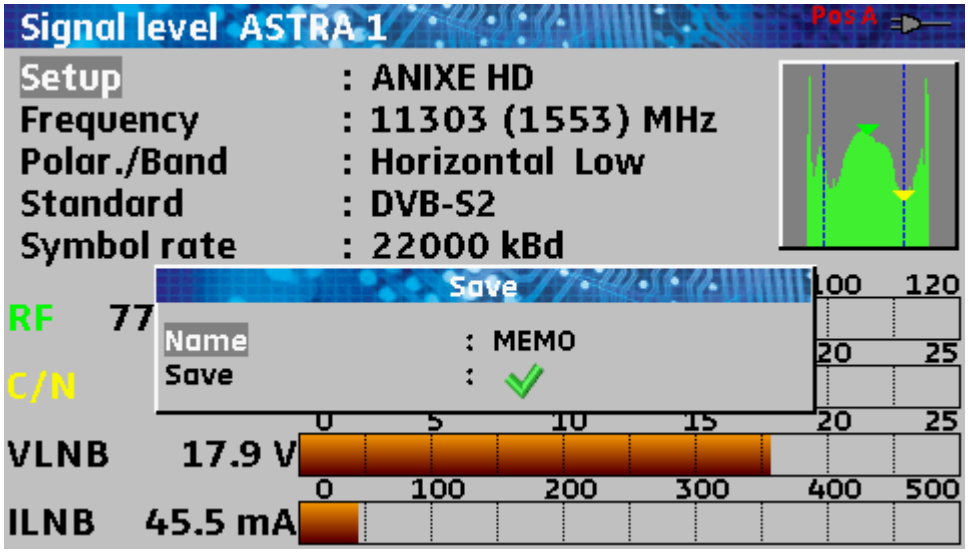
Push the Validation key for the third time

The third parameter is selected; you can change it with the knob.

Push the Validation key for the fourth time; no parameter is selected any more

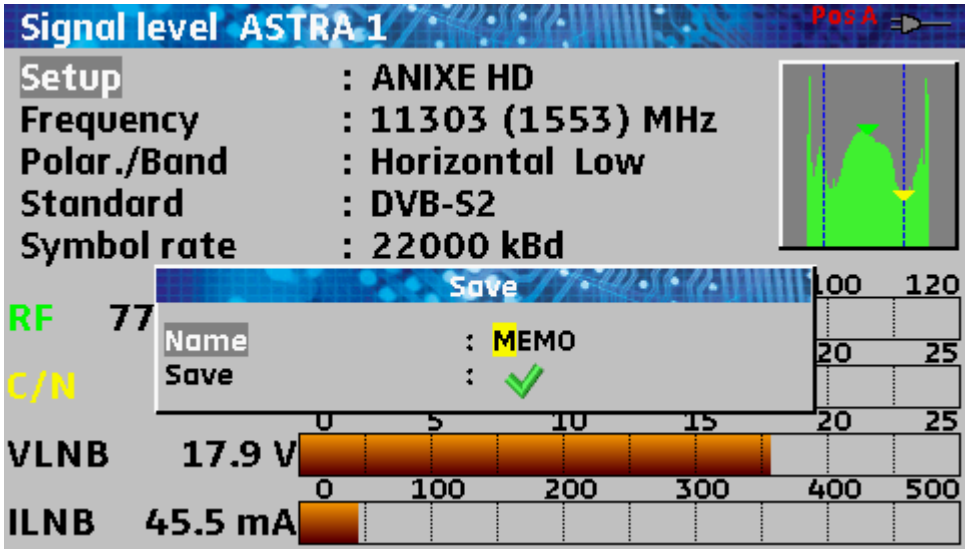
Pushing the Back key deselects the active parameter at any time

3.2.8.4 Entering a name



Push the Toolbox key

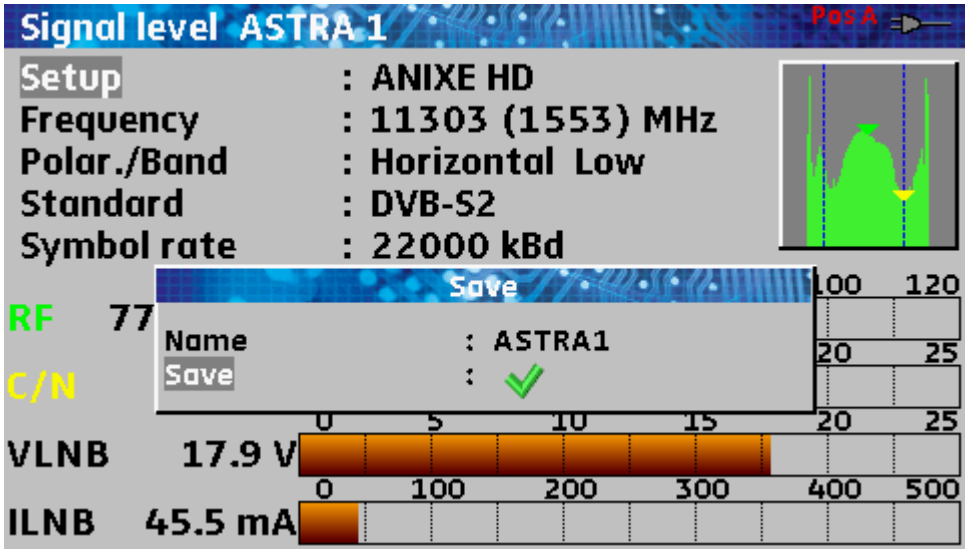
The Save window appears.



Push the Validation key

The first character of the name is selected

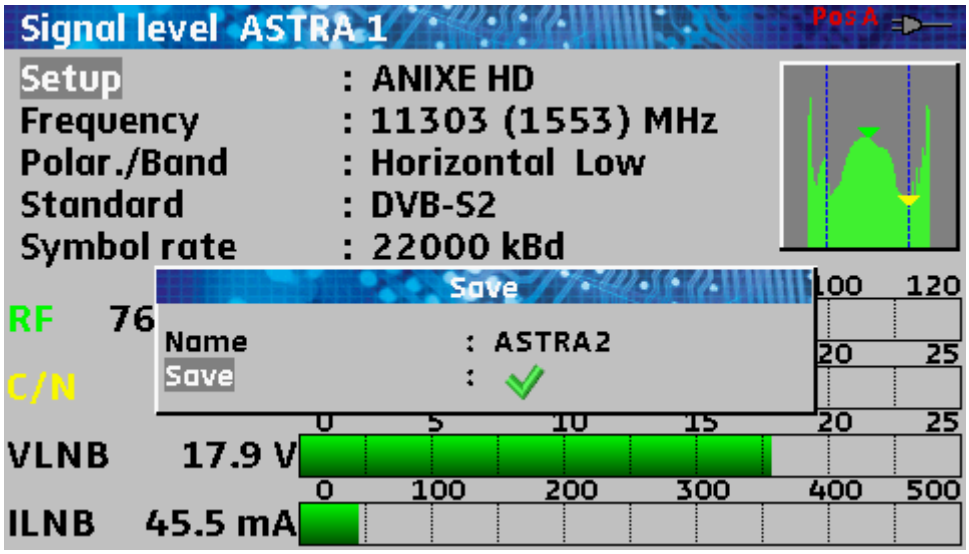
Turning the knob makes you change the character



Pushing the Validation key leads to the following character

After eight characters, you can save the name by pushing the Validation key.

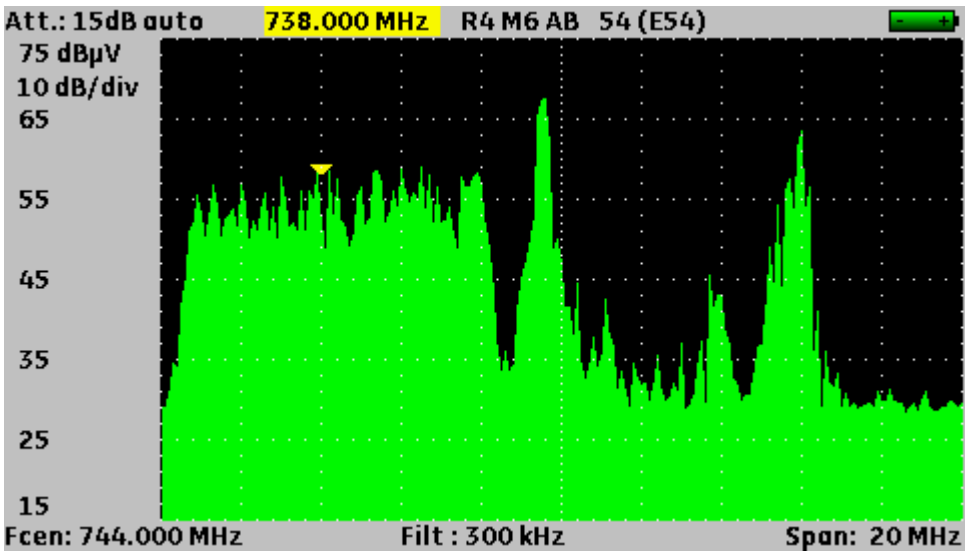
Pushing the Back key cancels the save procedure at any time.



If the end of the name is a series of numbers, they will be automatically incremented at the next save.

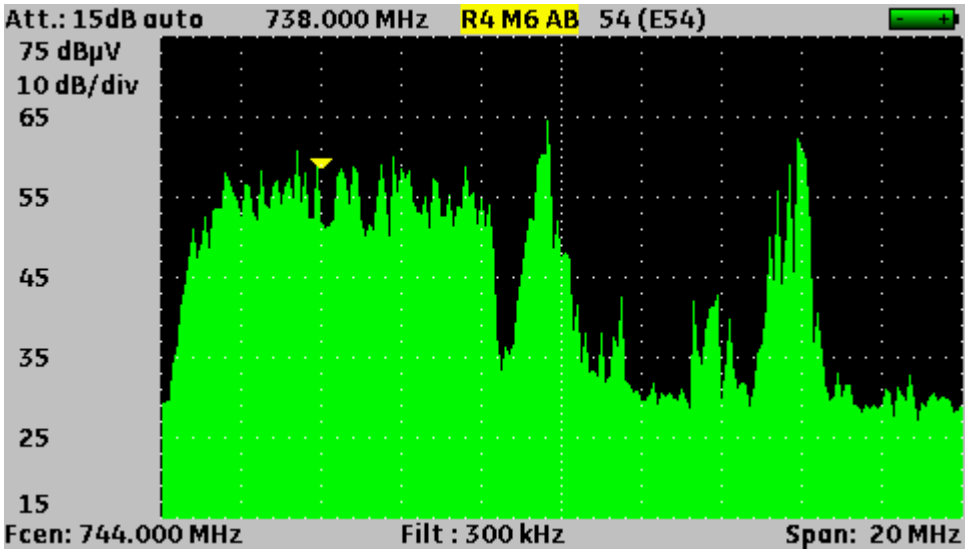
The last used name is saved even at the shutdown of the appliance.

3.2.8.5 Specific case of the spectrum analyzer



Pushing the Validation or Back key leads you to the next/previous parameter

Frequency of the cursor
Setup
Channel or polarization
Reference level
Number of dB/division
Central frequency
Span width



You can change the selected parameter with the knob (black on yellow).

3.2.9 List of measurements and setups

In order to make the call of information easier on the field, the appliance uses 20 lists of measurements, 50 lines each, 1000 setups each.

A setup corresponds with a terrestrial, cable or satellite emission.

A list of measurements corresponds with a specific installation: presence of several dishes, of various switches…

The same setup can be used in several measurement lists.

An installation can use two dishes:

ASTRA 19.2 in DiSEqC position A

HOT BIRD 13 in DiSEqC position B

Another installation can use three dishes:

ATLANTIC BIRD 3 in DiSEqC position A

ASTRA 1 in DiSEqC position B

HOT BIRD in DiSEqC position C

The same setup can be used several times in the same list of measurements:

ZDF SatCR slot 0

ZDF SatCR slot 1

ZDF SatCR slot 2

ZDF SatCR slot 3…

If a parameter of a setup is changed, by example a change of the bandwidth or a change from DVB-S to DVB-S2, only the setup in the library has to be updated.

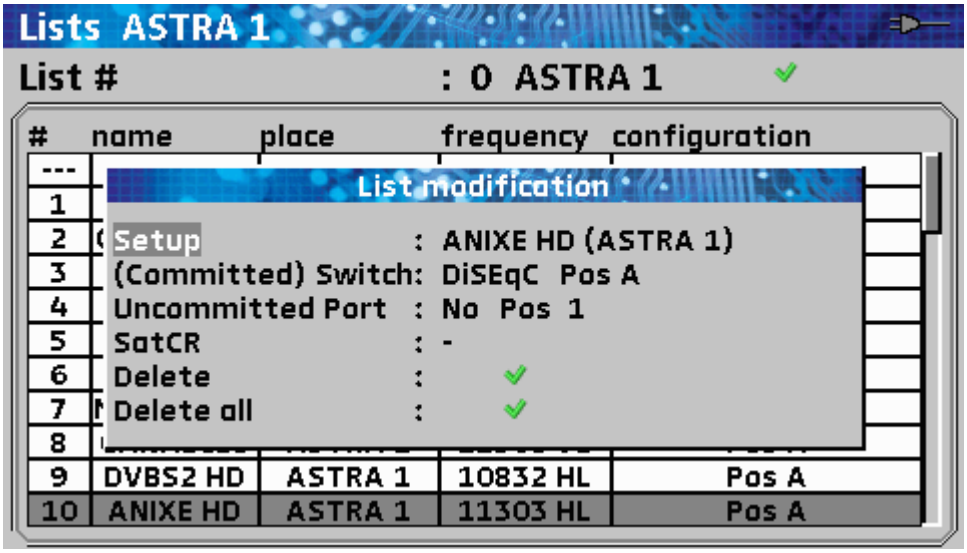
You can create these lists and setups with a computer on spreadsheet software and upload them into the appliance thanks to an USB.key.

A measurement list includes:

- the name of the list on 10 characters
- the lower frequency of the LNB (OL1)
- the higher frequency of the LNB (OL2)
- the selection mode lower band / higher band of the LNB
- the selection mode of the polarisation
- the presence and the position number of the position finder (for motorized dishes)
- 50 lines, each including:
    - a setup number corresponding with the list of setups
    - the presence and the functioning mode of a switch of the committed type
    - the position of the switch of the committed type
    - the presence and the functioning mode of a switch of the uncommitted type
    - the position of the switch of the uncommitted type
    - the presence of a SatCR item

- the number of the SatCR slot
- the position of the SatCR switch.

Some of these parameters are specific to the satellite band and have no influence on the terrestrial and cable modes.


Lists ASTRA 1
List # : 0 ASTRA 1
name place frequency configuration
List modification
Setup : ANIXE HD (ASTRA 1)
(Committed) Switch: DiSEqC Pos A
Uncommitted Port : No Pos 1
SatCR : -
Delete :
Delete all :
9 DVBS2 HD ASTRA 1 10832 HL Pos A
10 ANIXE HD ASTRA 1 11303 HL Pos A

Push the Parameters key

Rotate the knob to select a line in the list

Push the Validation key to open the modification page

Display of a list of measurements in spreadsheet software:

	A	B	C	D	E	F	G	H	I
1	Nom de la liste / List name	ASTRA1+HOT							
2	Fréquence OL1 / LO1 frequency	9750							
3	Fréquence OL2 / LO2 frequency	10600							
4	Sélection OL / LO setup	DiSEqC							
5	Sélection polarisation / Polarization setup	DiSEqC							
6	Positionneur / Positioner								
7									
8		Numéro de programme Setup number	Switch committed Committed switch	Position Switch committed Committed switch position	Switch uncommited Uncommitted switch	Position switch uncommited Uncommitted switch position	Activation SatCR SatCR enabled	Numéro de slot Slot number	Switch SatCR SatCR switch
9	0								
10	1	1	DiSEqC	Pos A					
11	2	2	DiSEqC	Pos A					
12	3	3	DiSEqC	Pos A					
13	4	4	DiSEqC	Pos A					
14	5	5	DiSEqC	Pos A					
15	6	6	DiSEqC	Pos A					
16	7	7	DiSEqC	Pos A					
17	8	8	DiSEqC	Pos A					
18	9	9	DiSEqC	Pos A					
19	10	10	DiSEqC	Pos A					
20	11	11	DiSEqC	Pos A					
21	12								
22	13	18	DiSEqC	Pos B					
23	14	19	DiSEqC	Pos B					
24	15	20	DiSEqC	Pos B					
25	16	21	DiSEqC	Pos B					
26	17	22	DiSEqC	Pos B					
27	18	23	DiSEqC	Pos B					
28	19	24	DiSEqC	Pos B					
29	20	25	DiSEqC	Pos B					

Prog Lst00 Lst01 Lst02 Lst03 Lst04 Lst05 Lst06 Lst07 Lst08 Lst09 Lst10 Lst11 Lst12 Lst13 Lst14 Lst15 Lst16 Lst17 Lst18 Lst19

Prêt Moyenne : 10175 Nb (non vides) : 4 Somme : 20350 100 %

A setup is made of:

- a setup name in 8 characters
- a site name in 10 characters
- a frequency
- a channel number for terrestrial band or cable
- a frequency plan for terrestrial band or cable
- a vertical or horizontal polarisation for satellite band
- a lower and higher LNB band for satellite band
- a standard
- an analogical audio mode mono/stereo/NICAM for terrestrial band or cable
- a type of constellation 64QAM 256QAM in DVB-C or MCNS
- a bandwidth 5, 6, 7 or 8 MHz in DVB-T
- a symbol output in DVB-C, MCNS, DVB-S, DVB-S2 or DSS
- a value for the guard interval in DVB-T
- the inversion or not of the spectrum in DVB-T

A few parameters have no influence according to the terrestrial, cable or satellite band or according to the standard.

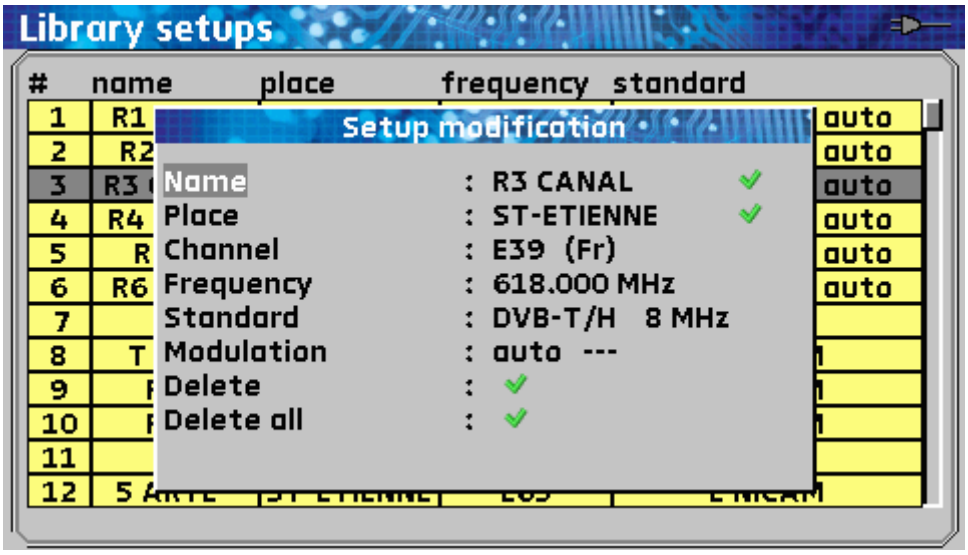
The name of the site allows you to distinguish two different emitters.

Frequency and channel number are equivalent: valid channel numbers take priority over frequencies.

The frequency plan parameter associated with the setup enable users close to boundaries to keep on using their channel numbers.

	Selecting a List on the **Measurement Lists** page calls back automatically all information assigned to this list.

	Selecting a **Setup** on one of these measurement pages calls back automatically all information assigned to this setup.



Push twice on the Parameters key

Rotate the knob to select a setup in the list

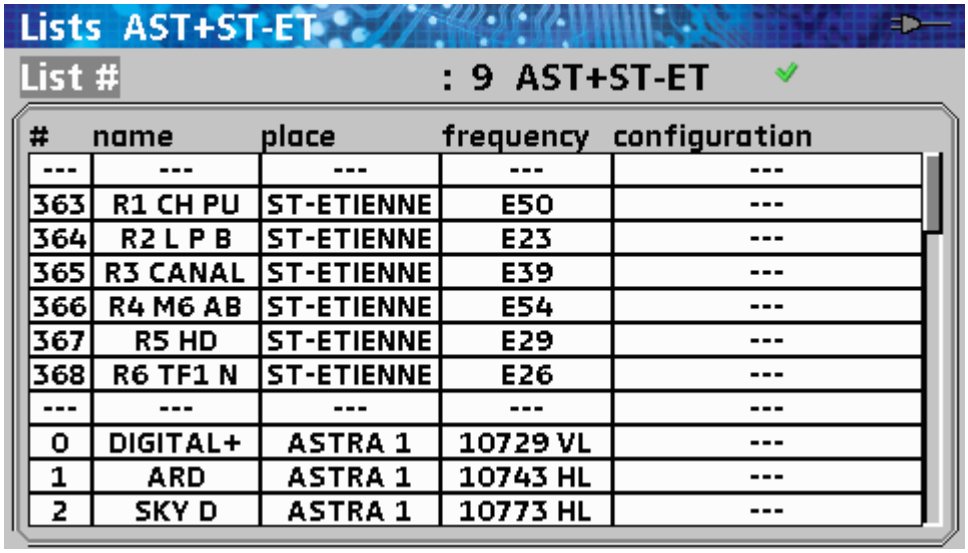
Push the Validation key to open the modification page

Display of a list of setups in spreadsheet software:

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1		Nom du programme Setup name	Nom du site Place name	Fréquence Frequency	N° de canal Channel #	Plan de fréquences Frequencies map	Polarisation Polarization	Bande LNB LNB band	Standard	Mode audio Audio mode	Constellation	Largeur de bande Bandwidth	Débit symbole Symbol rate	Intervalle de garde Guard interval	Inversion du spectre Spectrum inversion
2	0	DIGITAL+	ASTRA 1	10729,000			V		DVB-S2				22000		
3	1	ARD	ASTRA 1	10743,000			H		DVB-S				22000		
4	2	SKY D	ASTRA 1	10773,000			H		DVB-S2				22000		
5	3	DIGITAL+	ASTRA 1	10788,000			V		DVB-S				22000		
6	4	DIGITAL+	ASTRA 1	10817,000			V		DVB-S2				22000		
7	5	ANIXE HD	ASTRA 1	10832,000			H		DVB-S2				22000		
8	6	DIGITAL+	ASTRA 1	10847,000			V		DVB-S				22000		
9	7	TVP HD	ASTRA 1	10861,000			H		DVB-S				22000		
10	8	DIGITAL+	ASTRA 1	10876,000			V		DVB-S				22000		
11	9	UPC	ASTRA 1	10920,000			H		DVB-S				22000		
12	10	DIGITAL+	ASTRA 1	10979,000			V		DVB-S				22000		
13	11	SKY D	ASTRA 1	11023,000			H		DVB-S2				22000		
14	12	DIGITAL+	ASTRA 1	11038,000			V		DVB-S				22000		
15	13	DIGITAL+	ASTRA 1	11097,000			V		DVB-S				22000		
16	14	DIGITAL+	ASTRA 1	11156,000			V		DVB-S				22000		
17	15	ORANGE	ASTRA 1	11170,000			H		DVB-S2				22000		
18	16	ORF	ASTRA 1	11302,000			H		DVB-S2				22000		
19	17	DIGITAL+	ASTRA 1	11317,000			V		DVB-S				22000		
20	18	DASERSTE	ASTRA 1	11361,000			H		DVB-S2				22000		
21	19	DIGITAL+	ASTRA 1	11435,000			V		DVB-S2				22000		
22	20	HD+	ASTRA 1	11464,000			H		DVB-S2				22000		
23	21	CANALSAT	ASTRA 1	11479,000			V		DVB-S				22000		
24	22	GLOBECAS	ASTRA 1	11508,000			V		DVB-S				22000		
25	23	GLOBECAS	ASTRA 1	11538,000			V		DVB-S				22000		
26	24	CANALSAT	ASTRA 1	11567,000			V		DVB-S2				22000		
27	25	ASTRA	ASTRA 1	11597,000			V		DVB-S				22000		
28	26	DIGITAL+	ASTRA 1	11626,000			V		DVB-S2				22000		
29	27	UPC	ASTRA 1	11670,000			H		DVB-S				22000		
30	28	DIGITAL+	ASTRA 1	11685,000			V		DVB-S				22000		
31	29	SKY D	ASTRA 1	11719,000			H		DVB-S				27500		
32	30	VIACOM	ASTRA 1	11739,000			V		DVB-S				27500		
33	31	SKY D	ASTRA 1	11758,000			H		DVB-S				27500		
34	32	CANALSAT	ASTRA 1	11778,000			V		DVB-S				27500		
35	33	SKY D	ASTRA 1	11797,000			H		DVB-S				27500		
36	34	CANALSAT	ASTRA 1	11817,000			V		DVB-S				27500		
37	35	ARD	ASTRA 1	11836,000			H		DVB-S				27500		
38	36	CANALSAT	ASTRA 1	11856,000			V		DVB-S				27500		
39	37	SKY D	ASTRA 1	11875,000			H		DVB-S				27500		
40	38	CANALSAT	ASTRA 1	11895,000			V		DVB-S				27500		
41	39	SKY D	ASTRA 1	11914,000			H		DVB-S2				27500		
42	40	CANALSAT	ASTRA 1	11934,000			V		DVB-S				27500		

Prog Lst00 Lst01 Lst02 Lst03 Lst04 Lst05 Lst06 Lst07 Lst08 Lst09 Lst10 Lst11 Lst12 Lst13 Lst14 Lst15 Lst16 Lst17 Lst18 Lst19

With SPAROS SAT HD DVB-C, you can create a list with satellite and cable setups:
With SPAROS SAT HD DVB-T, you can create a list with satellite and terrestrial setups:


Lists AST+ST-ET
List # : 9 AST+ST-ET
name place frequency configuration
--- --- --- --- ---
363 R1 CH PU ST-ETIENNE E50 ---
364 R2 L P B ST-ETIENNE E23 ---
365 R3 CANAL ST-ETIENNE E39 ---
366 R4 M6 AB ST-ETIENNE E54 ---
367 R5 HD ST-ETIENNE E29 ---
368 R6 TF1 N ST-ETIENNE E26 ---
--- --- --- --- ---
0 DIGITAL+ ASTRA 1 10729 VL ---
1 ARD ASTRA 1 10743 HL ---
2 SKY D ASTRA 1 10773 HL ---

4 Set-up

All the material is proofed and checked before shipping and furnished in an adapted package. There are no particular instructions about unpacking.

The appliance is equipped with a lithium-ion battery (Li-ion). It is shipped with a loaded battery.

However, if the appliance has not worked for more than a month, you should check the status of charge of the battery and reload it if necessary.

4.1 Battery

	Caution: You need to dismantle the appliance for any intervention on the battery. Only a SPAUN technician must operate such dismantlement. Only use batteries provided by SPAUN electronic GmbH.

Security advice:

- ➔ Do not throw the pack battery into the fire; do not heat it
- ➔ Do not shunt the elements of the battery: risk of explosion!
- ➔ Do not pierce it
- ➔ Do not disassemble the pack battery
- ➔ Do not reverse the polarities of the battery
- ➔ The pack battery includes a protection item that should not be damaged or removed
- ➔ Do not stock the pack in a hot place
- ➔ Do not damage the protection casing of the pack
- ➔ Do not stock the pack in a vehicle that may be exposed to direct sunlight.

The life of the battery is 200 loading/unloading cycles.

Advice for a longer life of your battery:

- ➔ Do not unload it too much
- ➔ Do not stock the batteries too long without using them
- ➔ Stock the battery with ca. 40% loading
- ➔ Do not load or unload completely the battery before shelf.

When the battery is nearly completely unloaded, the appliance shows a "**Battery unloaded**" message, then turns off automatically after a few minutes.

4.2 Loading the battery

To load the battery in the appliance:

- Connect the external power supply provided on the jack plug of the appliance (on the right)
- Connect the power supply to the mains.

The internal charger starts loading the battery; the orange light **BAT** turns on.

The appliance must be off during this loading. When the battery is loaded, the BAT light will turn off.

It takes 1 hour 30 minutes to load the battery up to 80%. The total loading requires 2 hours 15 minutes.

The typical working capacity is approx. 2 hours with working remote supply (display of a HD picture)

4.3 External power supply

You can supply the appliance with an external power source under continuous voltage. The appliance works under 15V (1A). The charger block provided when you bought the appliance is also an external power supply.

4.4 Start-up

Push the ON/OFF key on the front keyboard.

The introduction window appears on screen.

The message "**Self test: in progress**" is shortly displayed before clearing.

4.5 Updating the software

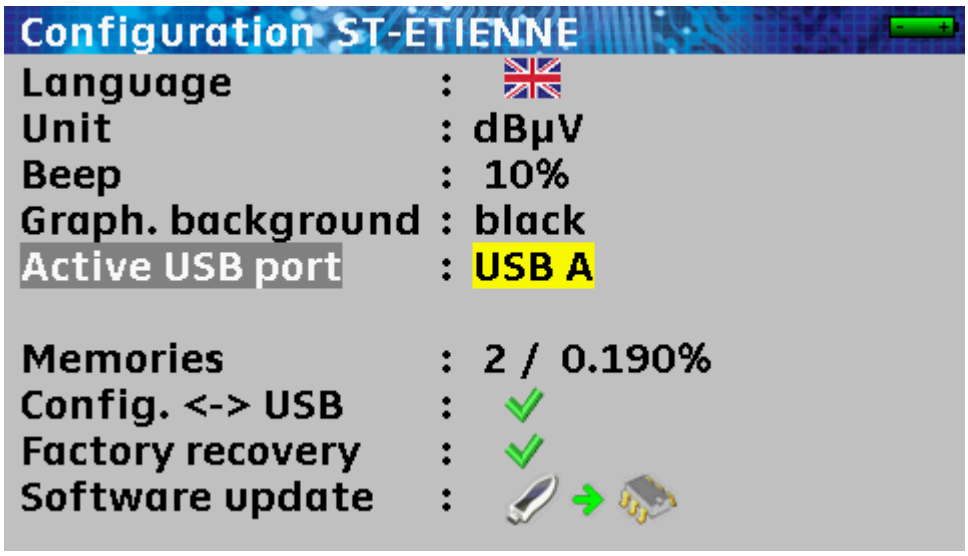
You can easily update the software to get new functions. The update process requires an USB key.

Download the update file **FIRM_vX.X.BIN** on our website (www.spaun.com):

Insert an USB key in your PC.
Copy this file on the home directory of the key.
Pull out the USB key.
Turn the appliance on: Check that the battery status is sufficient (> 30%). You'd better connect the appliance to the mains with the provided adapter.

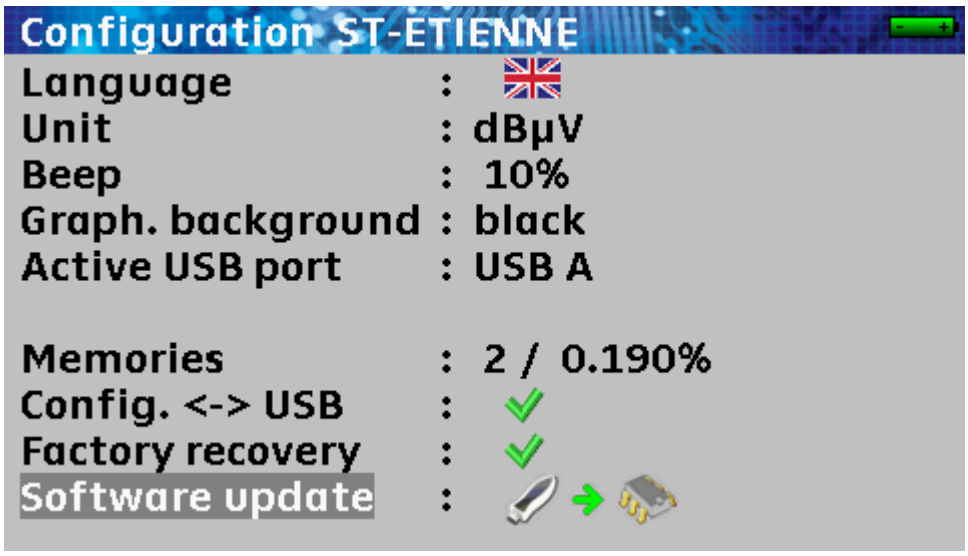
Push the Toolbox key to get the Configuration page.

Check that the active USB port is the USB port A and that nothing is connected to the USB port mini B.



Insert the USB key into the connector of the appliance.

Turn the knob to select Software update.



Push the Validation key

Caution: Do not turn the appliance off during the updating process

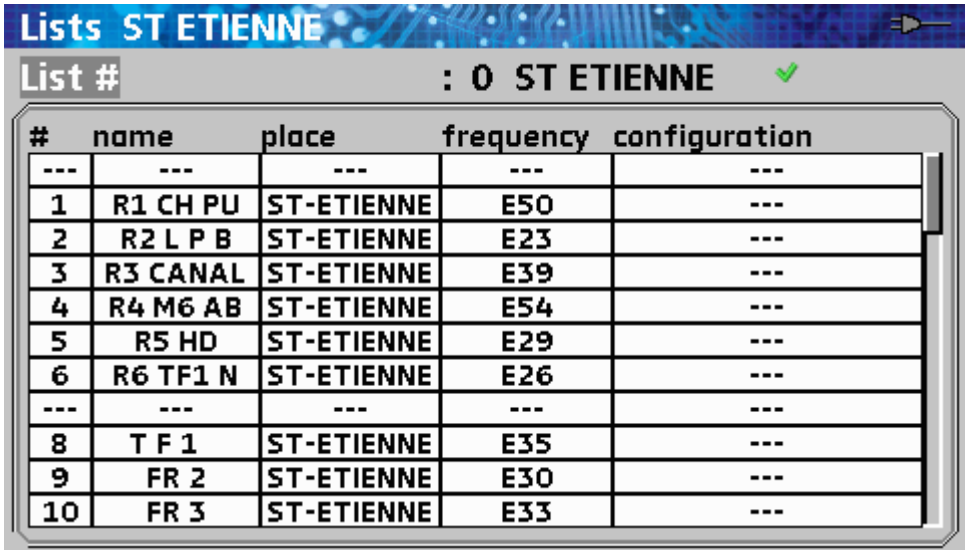
The updating process lasts approx. 3 minutes 30 seconds.

At the end of the updating process, the appliance invites you to push the ON/OFF key.

The software is now uploaded into your appliance.
A few error messages may appear: Do not take them into account.

5 Setting the parameters of the measurement lists

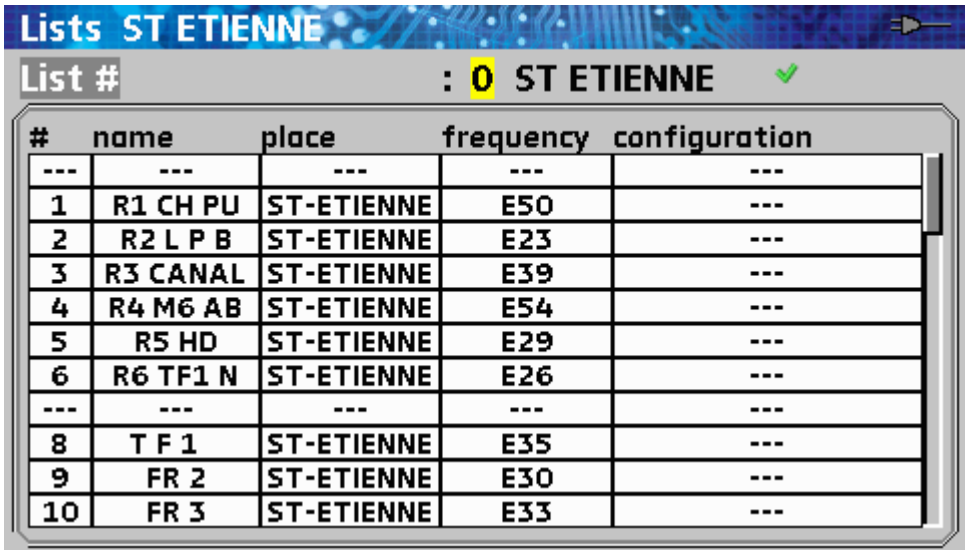
Pushing the PARAMETERS key gives you access to the **Parameters** function:



#	name	place	frequency	configuration
---	---	---	---	---
1	R1 CH PU	ST-ETIENNE	E50	---
2	R2 L P B	ST-ETIENNE	E23	---
3	R3 CANAL	ST-ETIENNE	E39	---
4	R4 M6 AB	ST-ETIENNE	E54	---
5	R5 HD	ST-ETIENNE	E29	---
6	R6 TF1 N	ST-ETIENNE	E26	---
---	---	---	---	---
8	T F 1	ST-ETIENNE	E35	---
9	FR 2	ST-ETIENNE	E30	---
10	FR 3	ST-ETIENNE	E33	---

In this page, you can change the measurement list, modify the name of the list, modify the parameters of a line, erase the data of a line and erase all data in the measurement list.

- Selection of an active measurement list among the twenty available ones



#	name	place	frequency	configuration
---	---	---	---	---
1	R1 CH PU	ST-ETIENNE	E50	---
2	R2 L P B	ST-ETIENNE	E23	---
3	R3 CANAL	ST-ETIENNE	E39	---
4	R4 M6 AB	ST-ETIENNE	E54	---
5	R5 HD	ST-ETIENNE	E29	---
6	R6 TF1 N	ST-ETIENNE	E26	---
---	---	---	---	---
8	T F 1	ST-ETIENNE	E35	---
9	FR 2	ST-ETIENNE	E30	---
10	FR 3	ST-ETIENNE	E33	---

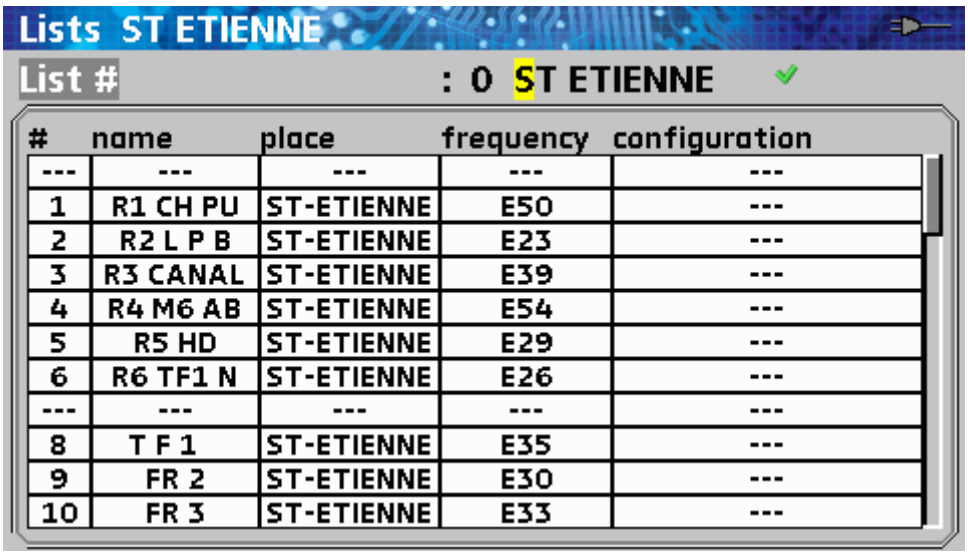
Push the Validation key

Rotate the knob to change of list

Push the Back key

When the list number is selected, you can also use the Toolbox key to display a selection list

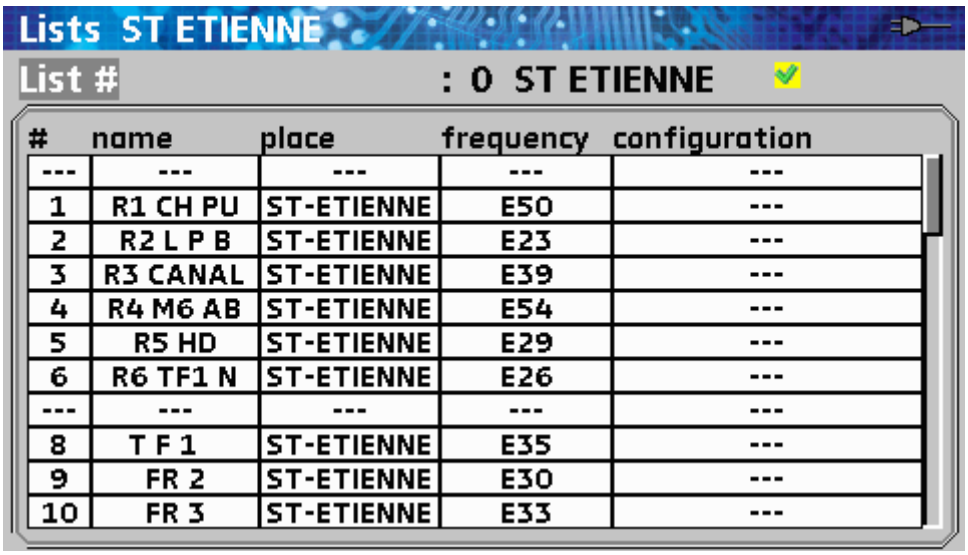
- **Modification of the name of the list**


Lists ST ETIENNE
List # : 0 ST ETIENNE
name place frequency configuration
--- --- --- --- ---
1 R1 CH PU ST-ETIENNE E50 ---
2 R2 L P B ST-ETIENNE E23 ---
3 R3 CANAL ST-ETIENNE E39 ---
4 R4 M6 AB ST-ETIENNE E54 ---
5 R5 HD ST-ETIENNE E29 ---
6 R6 TF1 N ST-ETIENNE E26 ---
--- --- --- --- ---
8 T F 1 ST-ETIENNE E35 ---
9 FR 2 ST-ETIENNE E30 ---
10 FR 3 ST-ETIENNE E33 ---

Push the Validation key to select the character to modify.

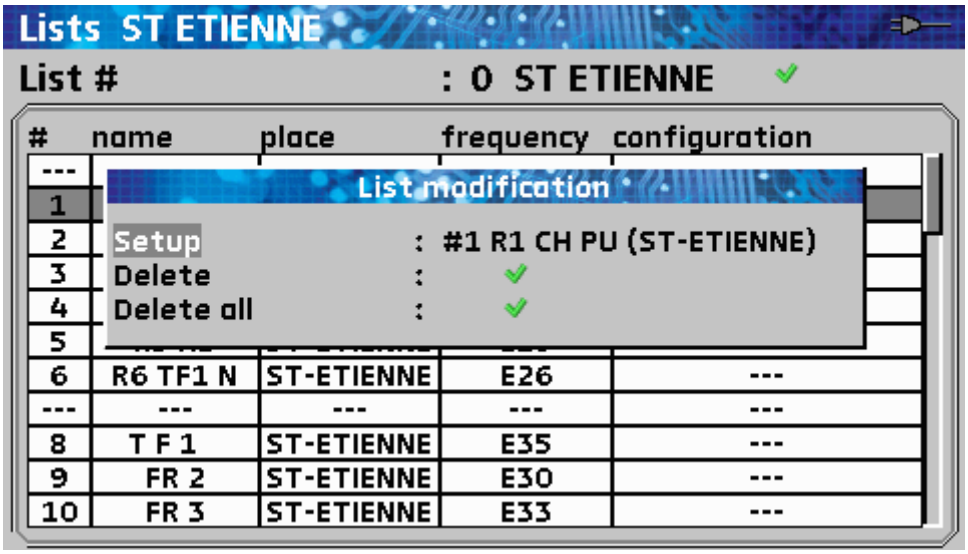
Rotate the knob to change the character

Push the Validation key to select the following character.


Lists ST ETIENNE
List # : 0 ST ETIENNE
name place frequency configuration
--- --- --- --- ---
1 R1 CH PU ST-ETIENNE E50 ---
2 R2 L P B ST-ETIENNE E23 ---
3 R3 CANAL ST-ETIENNE E39 ---
4 R4 M6 AB ST-ETIENNE E54 ---
5 R5 HD ST-ETIENNE E29 ---
6 R6 TF1 N ST-ETIENNE E26 ---
--- --- --- --- ---
8 T F 1 ST-ETIENNE E35 ---
9 FR 2 ST-ETIENNE E30 ---
10 FR 3 ST-ETIENNE E33 ---

Push the Validation key to validate the new name

- **Modification of data**


Lists ST ETIENNE
List # : 0 ST ETIENNE
name place frequency configuration
List modification
Setup : #1 R1 CH PU (ST-ETIENNE)
Delete :
Delete all :
6 R6 TF1 N ST-ETIENNE E26 ---
--- --- --- --- ---
8 T F 1 ST-ETIENNE E35 ---
9 FR 2 ST-ETIENNE E30 ---
10 FR 3 ST-ETIENNE E33 ---

Rotate the knob to reach the line to modify

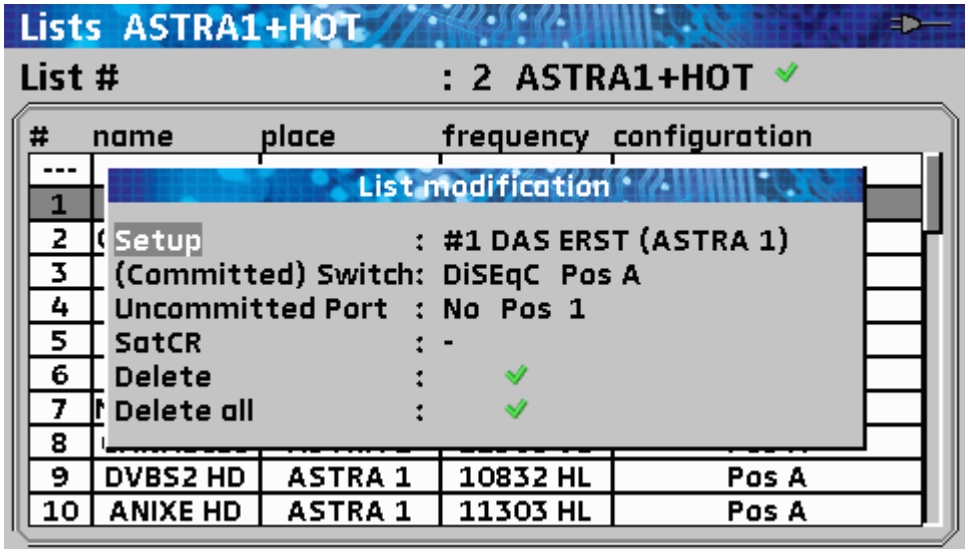
Push the Validation key to open the List modification page

You can change data after selection of the affected line thanks to the knob and after pushing the Validation key

The Delete line cancels all data in the current line.

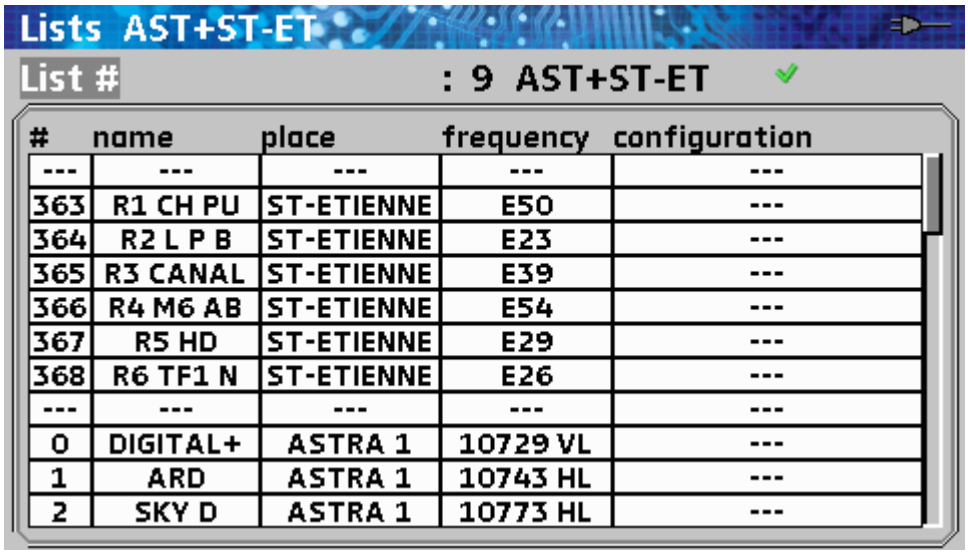
The Delete all line cancels all data in the current line (confirmation required).

In terrestrial band or cable band, only the number of the setup matters. In satellite band, there are also switches of committed and uncommitted type and the SatCR mode.


Lists ASTRA1+HOT
List # : 2 ASTRA1+HOT
name place frequency configuration
List modification
Setup : #1 DAS ERST (ASTRA 1)
(Committed) Switch: DiSEqC Pos A
Uncommitted Port : No Pos 1
SatCR : -
Delete :
Delete all :
9 DVBS2 HD ASTRA 1 10832 HL Pos A
10 ANIXE HD ASTRA 1 11303 HL Pos A

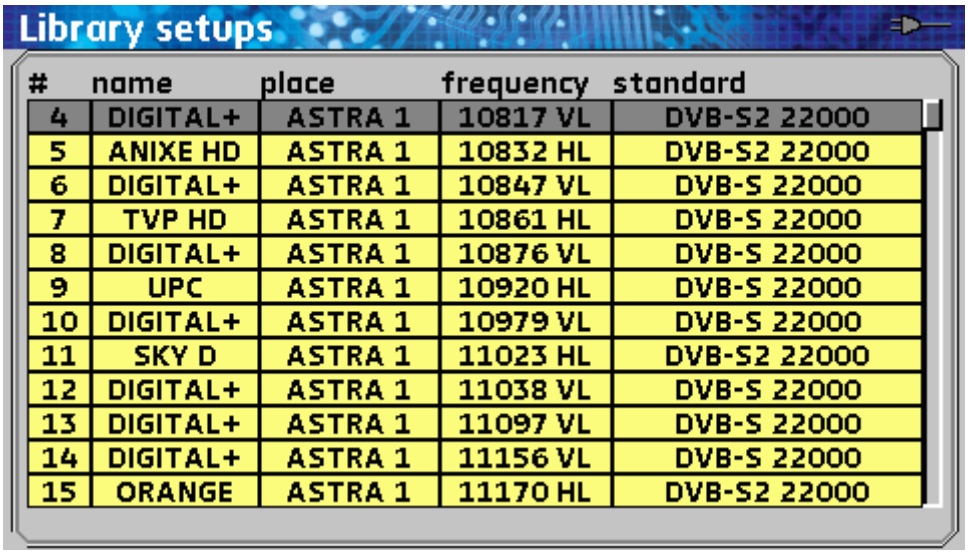
With SPAROS SAT HD DVB-C, you can create a list with satellite and cable setups:

With SPAROS SAT HD DVB-T, you can create a list with satellite and terrestrial setups:


Lists AST+ST-ET
List # : 9 AST+ST-ET
name place frequency configuration
363 R1 CH PU ST-ETIENNE E50 ---
364 R2 L P B ST-ETIENNE E23 ---
365 R3 CANAL ST-ETIENNE E39 ---
366 R4 M6 AB ST-ETIENNE E54 ---
367 R5 HD ST-ETIENNE E29 ---
368 R6 TF1 N ST-ETIENNE E26 ---
0 DIGITAL+ ASTRA 1 10729 VL ---
1 ARD ASTRA 1 10743 HL ---
2 SKY D ASTRA 1 10773 HL ---

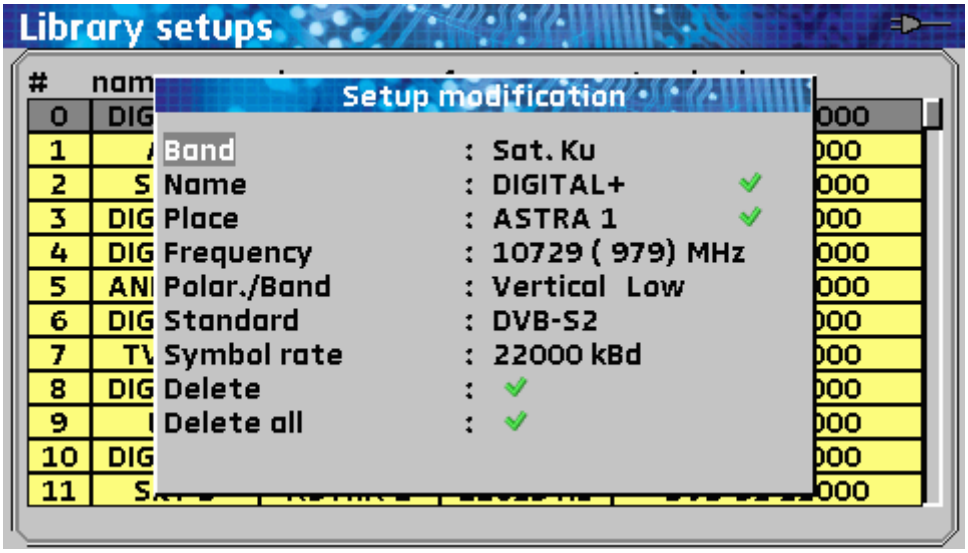
6 Library setups

Pushing twice on the Parameters key gives you access to the **Setup list** function:


Library setups
name place frequency standard
4 DIGITAL+ ASTRA 1 10817 VL DVB-S2 22000
5 ANIXE HD ASTRA 1 10832 HL DVB-S2 22000
6 DIGITAL+ ASTRA 1 10847 VL DVB-S 22000
7 TVP HD ASTRA 1 10861 HL DVB-S 22000
8 DIGITAL+ ASTRA 1 10876 VL DVB-S 22000
9 UPC ASTRA 1 10920 HL DVB-S 22000
10 DIGITAL+ ASTRA 1 10979 VL DVB-S 22000
11 SKY D ASTRA 1 11023 HL DVB-S2 22000
12 DIGITAL+ ASTRA 1 11038 VL DVB-S 22000
13 DIGITAL+ ASTRA 1 11097 VL DVB-S 22000
14 DIGITAL+ ASTRA 1 11156 VL DVB-S 22000
15 ORANGE ASTRA 1 11170 HL DVB-S2 22000

In this page, you can create a new setup, change the parameters of a setup, erase data in a setup and erase the data of all setups.

- **Modification of the data in a setup**



Rotate the knob to reach the setup to modify

Push the Validation key to open the Setup modification page

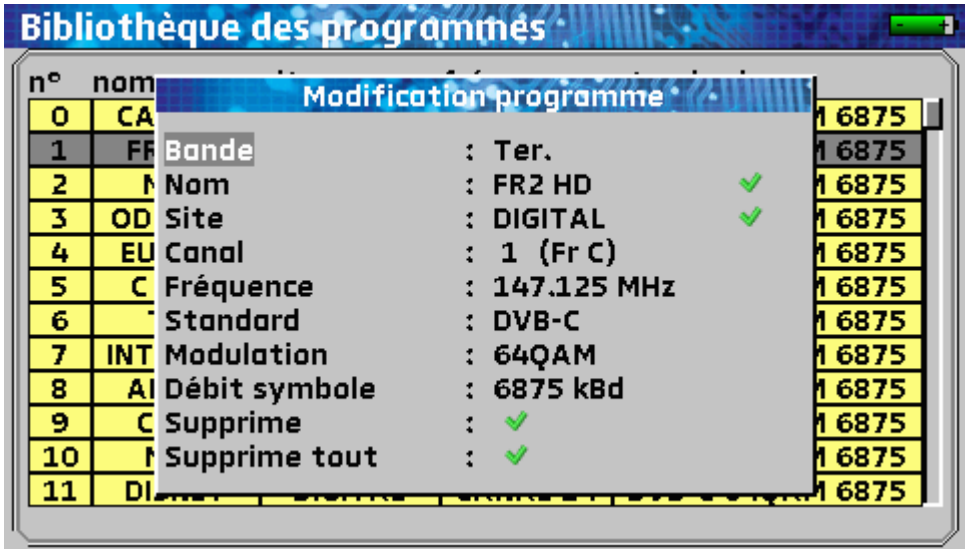
You can modify data after selection of the line to change with the knob and the Validation key

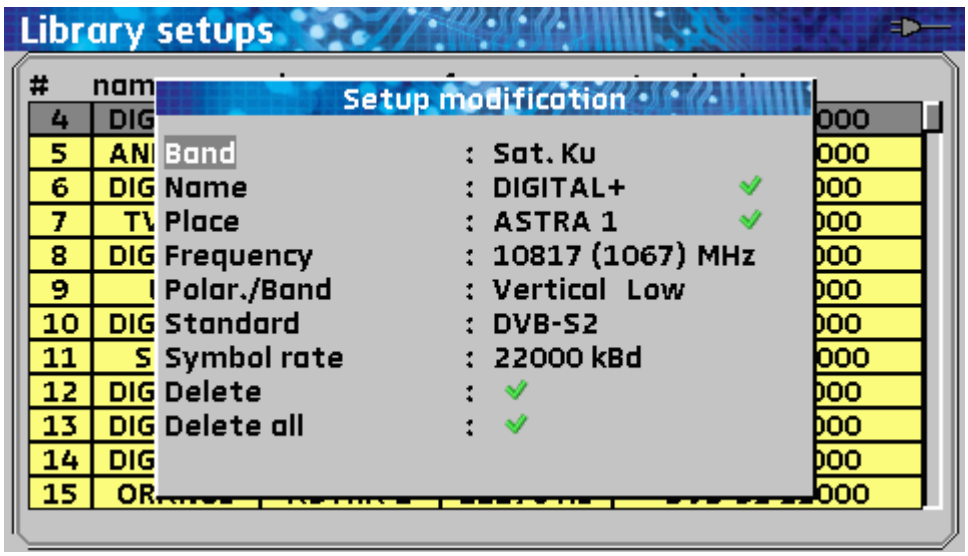
The band line allows choosing the frequency band.

The Delete line cancels all data in the current line.

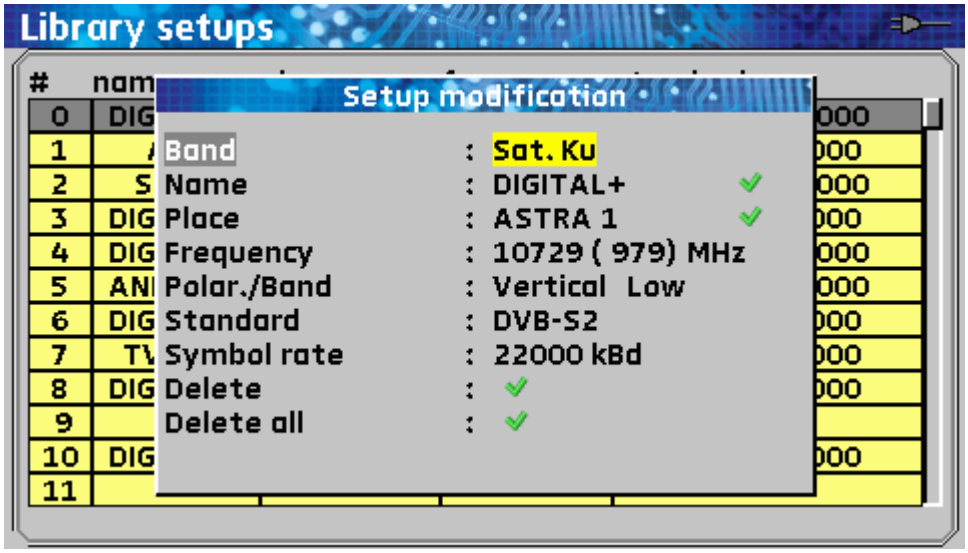
The Delete all line cancels all data in the current line (confirmation required).

According to the terrestrial, cable or satellite band and to the selected standard, the content of the page is different.





The « band » parameter allows choosing between these frequencies ranges:



Ter. : Terrestrial

Sat. L : Satellite L band (950Mhz-2150MHz)

Sat. Ku : Satellite Ku band (10700-12750MHz)

Sat. C : Satellite C band (3000-4200MHz)

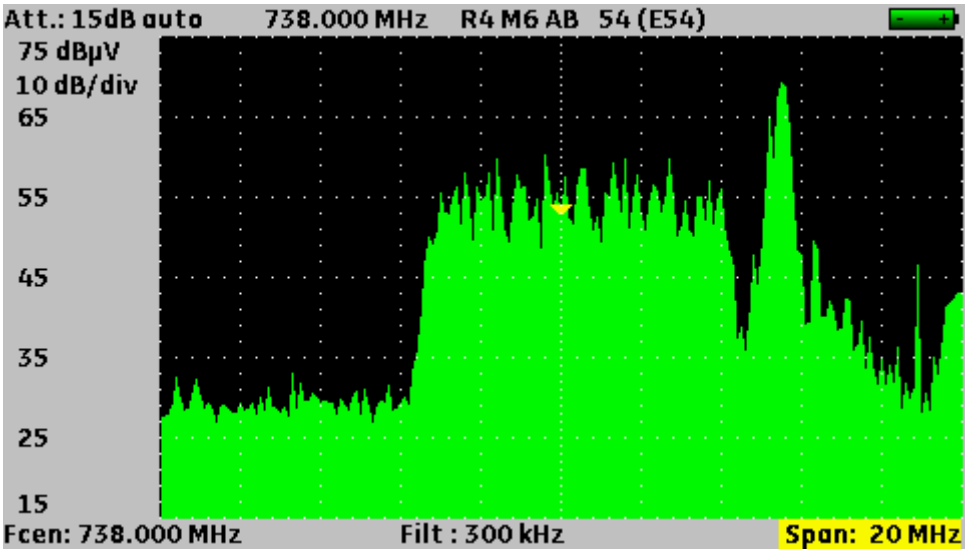
	SPAROS SAT HD: Satellite C band + L band + Ku band. SPAROS SAT HD DVB-C & DVB-T/H: Terrestrial band + Satellite C band + L band + Ku band.

	For SPAROS SAT HD DVB-C & DVB-T/H , (allowing terrestrial or satellite setups) it's possible to change from terrestrial to satellite by: - changing the frequency band - changing the frequency - changing the standard

7 Spectrum analyzer

Pushing the Spectrum key gives you access to the **Spectrum analyzer** function:

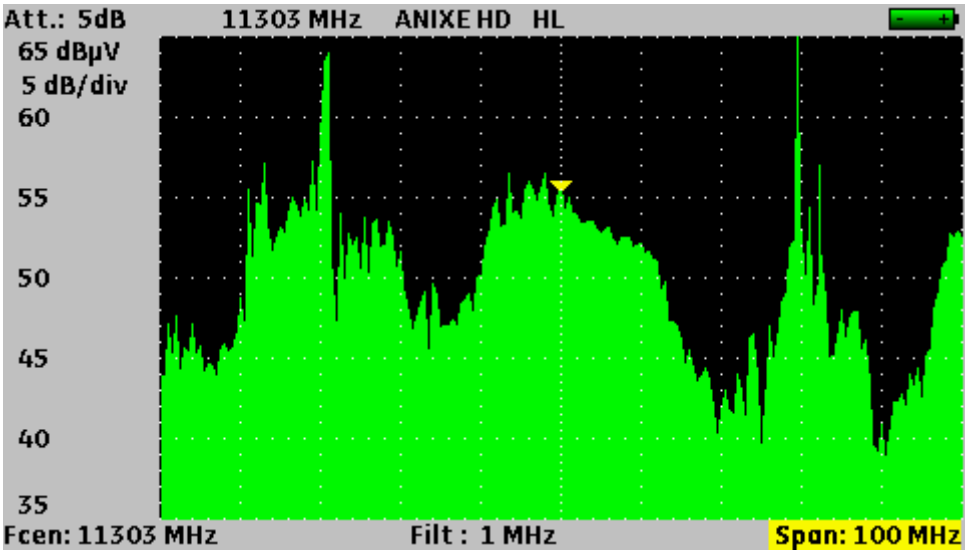
In terrestrial band or cable band, the analysis filter is 300 kHz wide.



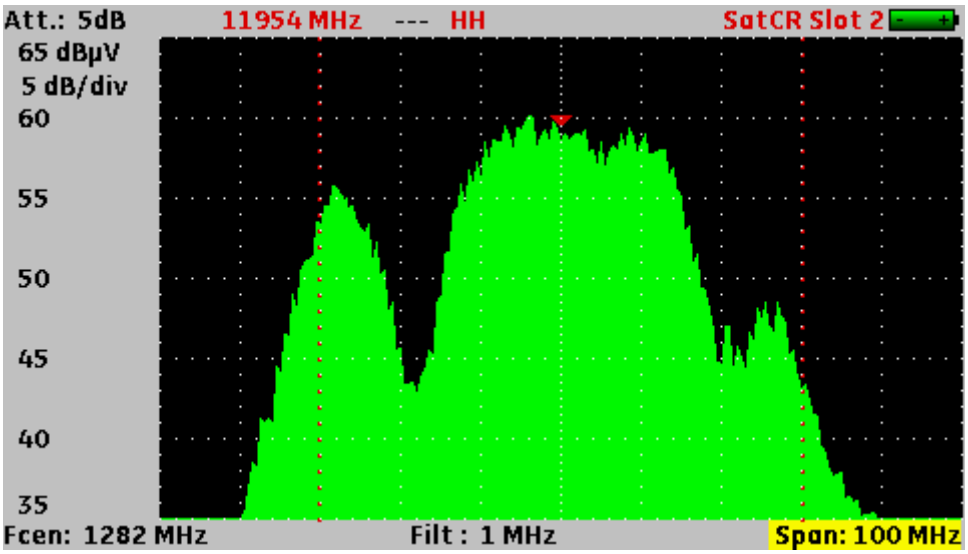
You can move the cursor along the frequency range, channel per channel or setup per setup.

You access the various setups with the Validation key;

you change them with the knob.



In satellite band, the analysis filter is 1MHz wide. You can directly change the polarization and the band, hence an easier adjustment of the counter-polarization.



In SatCR mode, two red-dotted lines indicate the width of the slot.

If the measurement list includes setups with all possible slots, you can display them very easily by simply changing of setup.

The current slot number is displayed on the upper right of the screen.

You can change the following parameters:

- The frequency of the cursor
- The number of the setup
- The number of the channel or the polarization and the band
- The reference level
- The number of dB/division
- The central frequency
- The span width (span)

	The default position of the input pad is in automatic mode. Any change of the reference level stops the automatic mode. Only a return to the Spectrum page will re-launch it.

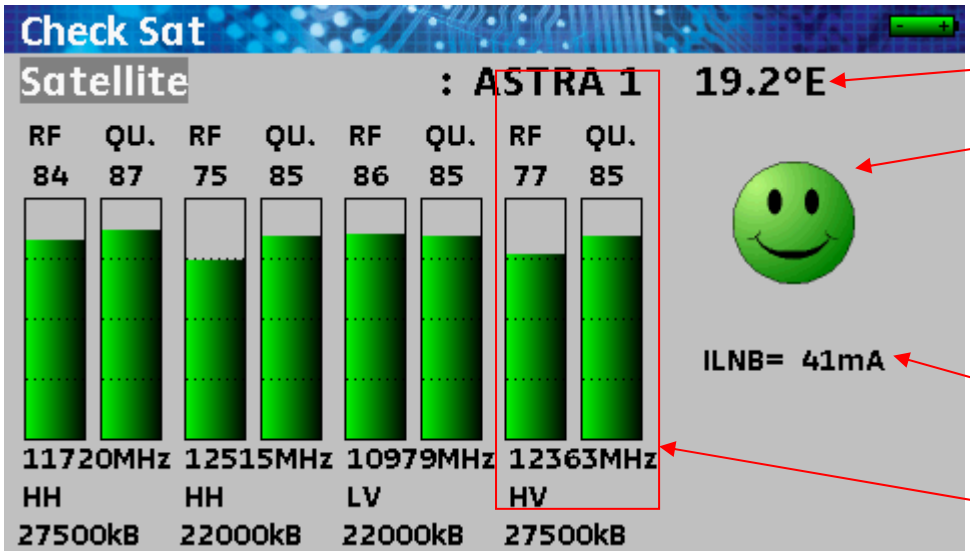
	In manual input pad mode, the input level must be lower than Att + 50 dBµV to prevent any saturation of the input and any false representation. Example: To correctly display an 110dBµV signal, you need a 60dB pad.

	For SPAROS SAT HD DVB-C & DVB-T/H (allowing terrestrial and satellite setups) it's possible to change from terrestrial to satellite in spectrum by: - changing frequency with the knob - changing the setup

8 Dish adjustment

	Only in Satellite band The dish adjustment mode enables you to quickly orientate the dish with the initial selection of the satellite to receive.

Push the Spectrum key twice to access to the **Dish adjustment** function.


Check Sat
Satellite
: ASTRA 1
19.2°E
RF QU. RF QU. RF QU. RF QU.
84 87 75 85 86 85 77 85
ILNB= 41mA
11720MHz 12515MHz 10979MHz 12363MHz
HH HH LV HV
27500kB 22000kB 22000kB 27500kB
Name and position of the satellite
Indication of global quality
Supply intensity of the LNB
Frequency, polarization, band, level and quality

The appliance has 32 orbital positions available for satellites. About 10 satellites are specified at delivery.

4 transponders are associated to each satellite.

Use the Validation key and the knob to change of satellite.

8.1 Updating the satellites

You can now add new satellites and update or erase old ones with a computer and a USB key.
Open the Sat.xls file with a spreadsheet software.

Change the values as required.

	The locking time depends on the transponder rate. The lower the rate, the longer the locking time. Thus, you'd better choose high rate transponders to align the dish.

Save the file.

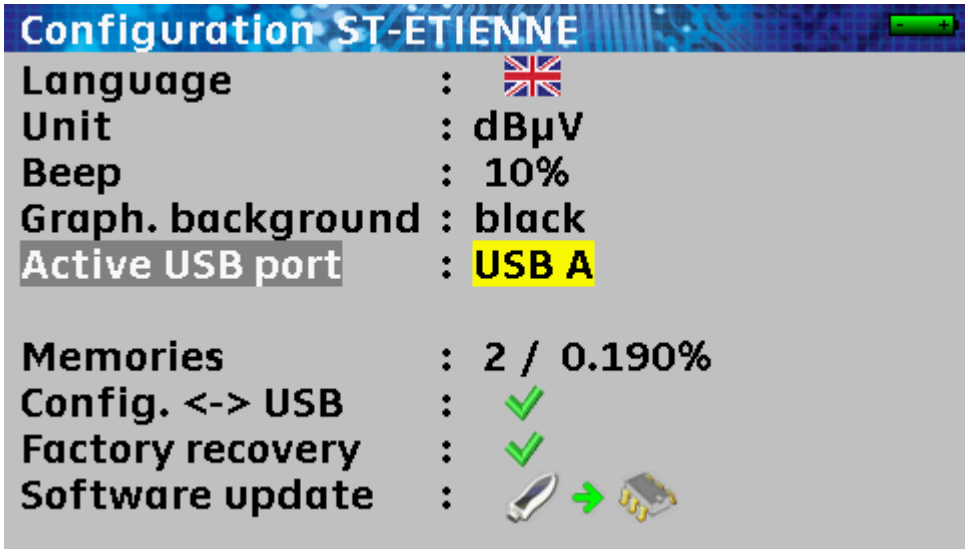
Save the file once again under CSV format; call it Sat.csv.

There is a CSV macro-command that does it all: Ctrl + Shift + C on keyboard. (Office 2007 2010 only)

Copy the Sat.csv file on the home directory of the USB key.

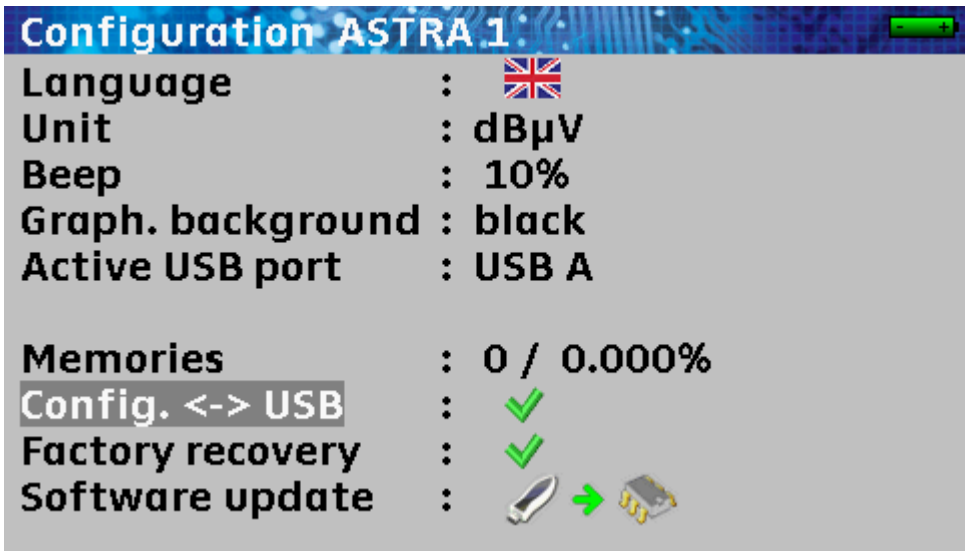
Push the Toolbox key until reaching the Configuration page.

Check that the active USB port is the port USB A, and that nothing is connected to the USB port mini B.



Insert the USB key into the connector of the appliance.

Turn the knob to select the line Config. <-> USB.



Push the Validation key

The previous configuration is saved on the key; the new one is transferred to the appliance.

8.2 Dish adjustment process

Procedure:

1/ Connect the dish to the appliance; turn it on.

2/ Validate the remote supply:

- The VDC light turns on the front side.
- Check the supply intensity of the LNB (about 50 to 200 mA).

3/ Select the satellite for alignment in the list (with the knob).

4/ Slowly turn the dish until you get the highest level and hearing the locking signal.

5/ Slightly turn the LNB to get the highest quality (counter-polarization).

You can hear a melody as soon as the first transponder has been found; then, you will hear beeps.

The higher the quality, the more frequent these beeps.

If the appliance has not been synchronized on all four transponders, the quality indicator is **red**.

If the appliance is synchronized on all four transponders but the reception quality is medium, it is **orange**.

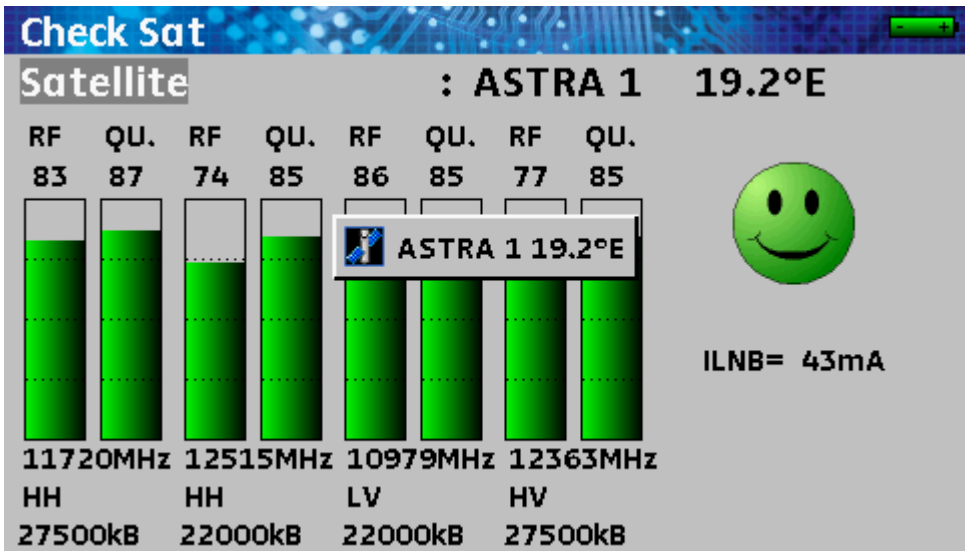
If the appliance is synchronized on all four transponders and if the reception quality is good, it is **green**.

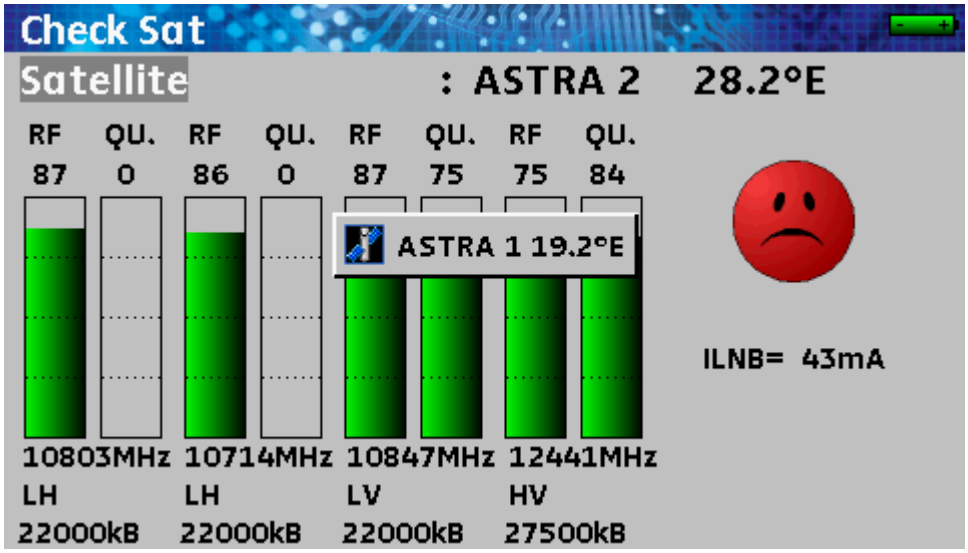
	Caution: **To identify a satellite, the appliance must be synchronized on all 4 transponders.** **However, some transponders are regularly modified.** **Consult the frequency plan of the satellite when the transponder does not seem to work.** **Some switches or LNB only work with DiSEqC commands. In this case, position the OL and the polarization on DiSEqC at the LNB-DiSEqC configuration page (Caution: the orientation will be slower if you use the DiSEqC command).**

8.3 Control of the satellite

To check if the selected satellite is the one you want: push the Spectrum key

Then, the appliance looks for the MPEG NIT table on one of the 4 transponders and displays the name of the satellite:


Check Sat
Satellite : ASTRA 1 19.2°E
RF QU. RF QU. RF QU. RF QU.
83 87 74 85 86 85 77 85
ASTRA 1 19.2°E
ILNB= 43mA
11720MHz 12515MHz 10979MHz 12363MHz
HH HH LV HV
27500kB 22000kB 22000kB 27500kB


Check Sat
Satellite : ASTRA 2 28.2°E
RF QU. RF QU. RF QU. RF QU.
87 0 86 0 87 75 75 84
ASTRA 1 19.2°E
ILNB= 43mA
10803MHz 10714MHz 10847MHz 12441MHz
LH LH LV HV
22000kB 22000kB 22000kB 27500kB

	Caution: **The displayed name depends on the content of the MPEG NIT table.** **Some providers do not (or badly) furnish this table.** **The displayed information may be wrong.**

Level / Power Measurement

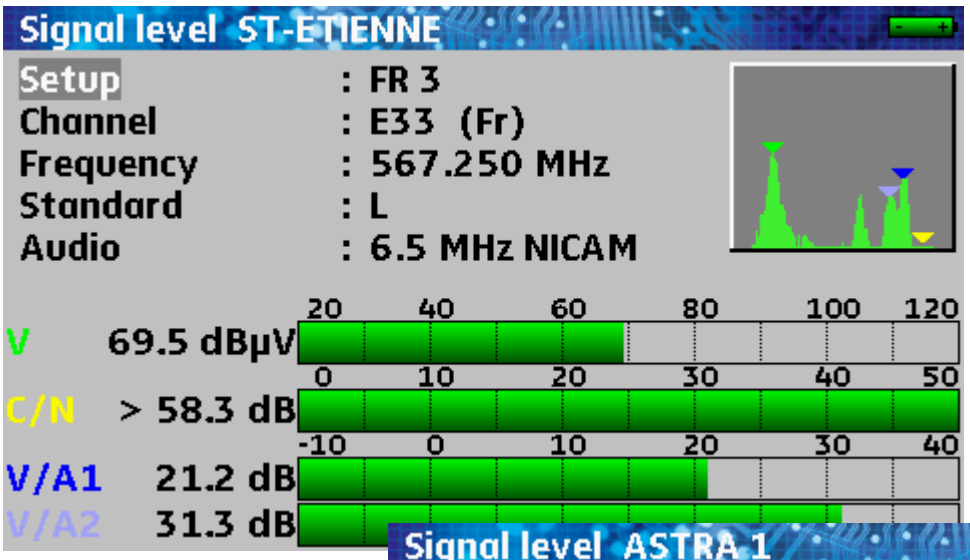
Pushing the Measurement key gives you access to the **Level measurement** function.

It is thus possible to make a level measurement at a specified frequency with a detection mode adapted to the standard.

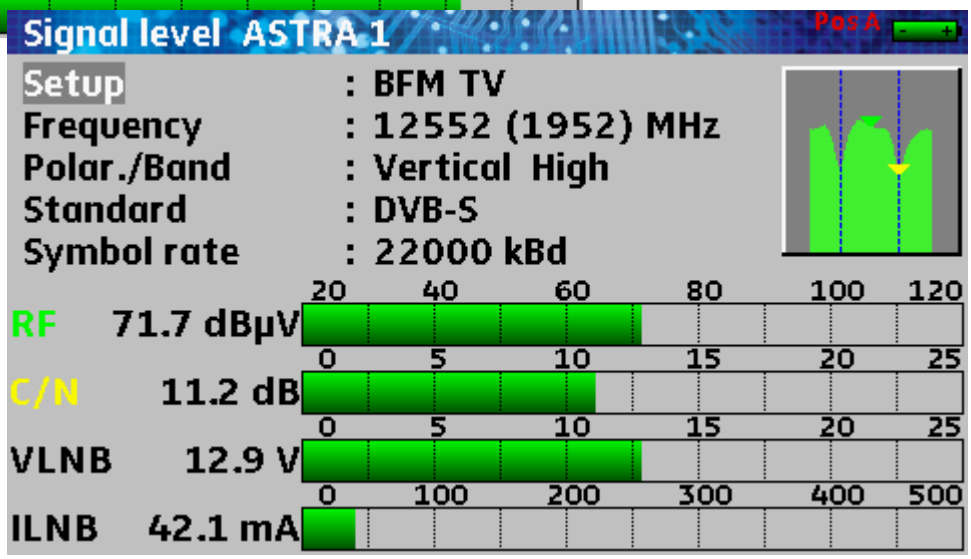
You can either make measurements on a saved setup (see chapter Setting the parameters of the measurement lists) or modify each parameter manually.

	In terrestrial band, for a user plug, the level should be: - **between 50 and 66 dBµV in FM** - **between 45 and 70 dBµV in DVB-T/H** - **between 57 and 74 dBµV in any other case.**

	In satellite band, for a user plug, the level should be: - **between 55 and 75 dBµV.**



Terrestrial band



Satellite band

8.4 Modification of the parameters

The various parameters are:

- The number of the setup
- The number of the channel and the corresponding frequency plan for the terrestrial and cable band
  or
  the polarization and the band for the satellite.

	Caution: The vector of these commutations is the remote supply; the 22kHz modulation or DiSEqC is superimposed on the continuous voltage generated by the appliance.

- The frequency of the emitter or the transponder (and the real frequency in satellite)
- The standard and the bandwidth for the DVB-T/H
- The audio mode for the analogical TV
- The symbol rate for the digital TV.

	For SPAROS SAT HD DVB-C & DVB-T/H , (allowing terrestrial and satellite setups) it's possible to change from terrestrial to satellite in level/power measurement by: - changing frequency - changing standard - changing the setup (from terrestrial to satellite setup)

See chapter Man-machine interface for any modification.

8.5 Measurements according to the standard

The appliance makes various measurements according to the valid **standard**.

The available measurements are **Average**, **Peak** and **Power**.

8.5.1 Terrestrial band

The appliance automatically makes level measurements on the **Video carrier wave** and on **1 or 2 Sound carrier waves** according to the selected Audio mode.

The table below lists the measurement types and the frequencies of the audio carrier waves of each standard:

Standard	Video carrier wave	Measure	Sound carrier waves		
			Mono	Stereo	NICAM
BG	negative, AM	Peak	FM 5.5 MHz	FM 5.74 MHz	DQPSK 5.85 MHz
DK	negative, AM	Peak	FM 6.5 MHz	FM 6.258 MHz	DQPSK 5.85 MHz
I	positive, AM	Peak	FM 6.0 MHz		DQPSK 6.552 MHz
L	positive, AM	Peak	AM 6.5 MHz		DQPSK 5.85 MHz
MN	negative, AM	Peak	FM 4.5 MHz	FM 4.72 MHz	
DVB-C	Digital	Power			
MCNS	Digital	Power			
DVB-T/H	Digital	Power			
FM	FM	Average			
Carrier	Non modulated	Average			

The appliance displays the level of the **Video** carrier wave, the ratio(s) **Video/Audio** and the ratio **C/N**.

The display is made of one to four measures and bar graphs.

The measurement of the **Audio** carrier waves is always an **Average** measurement.

8.5.2 Satellite band

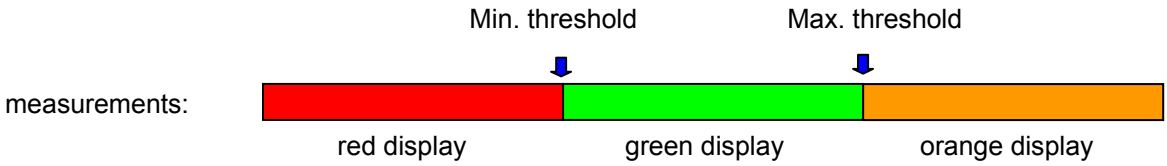
Standard	Video carrier wave	Measurement
PAL	FM	Peak
SECAM	FM	Peak
NTSC	FM	Peak
DVB-S	Digital	Power
DSS	Digital	Power
DVB-S2	Digital	Power

8.6 Thresholds

Predefined thresholds are used to specify if the measurement is pertinent.

Standard	Min.	Max.
Terrestrial analogical TV	57	74
DVB-C, MCNS	57	74
DVB-T/H	35	70
FM, carrier wave	50	66
Satellite analogical TV	47	77
DVB-S, DSS	47	77
DVB-S2	47	77

Decision thresholds are used for the display of the measurements « Power Level » and « Measurement Plan »:



9 Measurement of error rates

Pushing several times on the Measurement key gives you access to the **Measurement of error rates** function.

The displayed values are the different **BER** (Bit Error Rate), the **PER** (Packet Error Rate) and the **MER** (Modulation Error Ratio) in **DVB-T/H, MCNS, DVB-C, DVB-S, DVB-S2** or **DSS.**

	The bar graphs are displayed in colours according to the measurement values for the error rates: - GREEN: right error rates - ORANGE: BERo > **1-4** (QEF: Quasi Error Free) without lost packet - RED: lost packets (PER) The Automatic Frequency Control (AFC) is automatically activated in case of measurement of error rates.

These measures are available if one of these standards is in process in the **Level measurement** page:

- DVB-T/H (SPAROS SAT HD DVB-T/H)
- DVB-C, MCNS (SPAROS SAT HD DVB-C)
- DVB-S, DSS, DVB-S2 (each SPAROS SAT HD model)

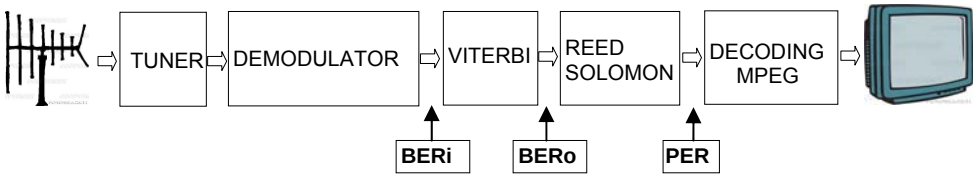
The parameters on this page are the same as on the page Level measurement with additional parameters specific to each modulation.

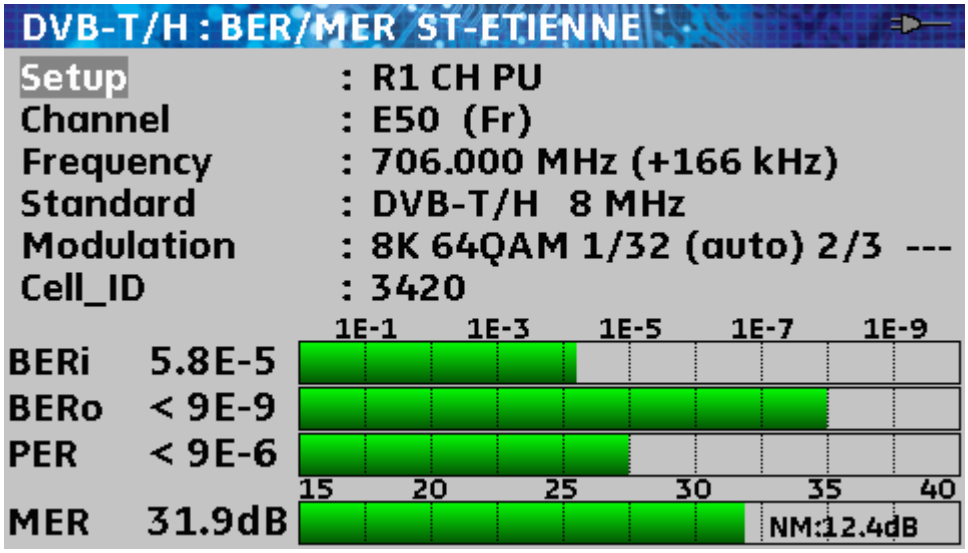
	The **"Sync ?"** message specifies that the signal is absent or not locked; check its presence, the modulation parameters, the remote supply and the LNB and DiSEqC parameters in satellite band.

	The sign **<** before an error rate value means that there were no error but 10^X bits have been tested (ex. $<1^{E-8}$ means 1^{E8} bits have been tested).

	For SPAROS SAT HD DVB-C & DVB-T/H , (allowing terrestrial and satellite setups) it's possible to change from terrestrial to satellite in measurement of error rate by: - changing frequency - changing standard - changing the setup (from terrestrial to satellite setup)

9.1 DVB-T/H (SPAROS SAT HD DVB-T only)




DVB-T/H : BER/MER ST-ETIENNE
Setup : R1 CH PU
Channel : E50 (Fr)
Frequency : 706.000 MHz (+166 kHz)
Standard : DVB-T/H 8 MHz
Modulation : 8K 64QAM 1/32 (auto) 2/3 ---
Cell_ID : 3420
1E-1 1E-3 1E-5 1E-7 1E-9
BERi 5.8E-5
BERo < 9E-9
PER < 9E-6
15 20 25 30 35 40
MER 31.9dB
NM:12.4dB

Display of the values:

- **BERi**: error rate before Viterbi
- **BERo**: error rate after Viterbi
- **PER**: error rate after Reed Solomon (packet error rate)
- **MER**: modulation error rate
- **NM**: noise margin

BERx: 'bits' error rate

Ratio of the number of erroneous bits / number of transmitted bits during the measuring time

PER: 'packets' error rate

Ratio of the number of erroneous packets / number of transmitted packets during the measuring time

Remember: a packet in DVB-T/H is made of 204 bytes; a packet is 'wrong' if it includes more than 8 wrong bytes (correction by Reed Solomon coding).

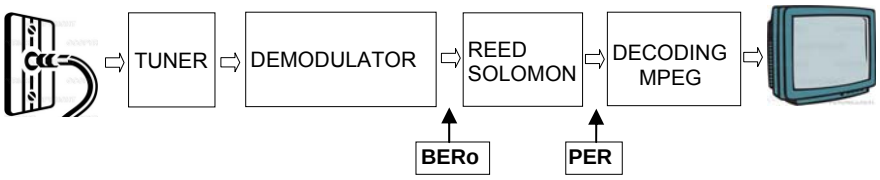
Display of the detected **Modulation** type:

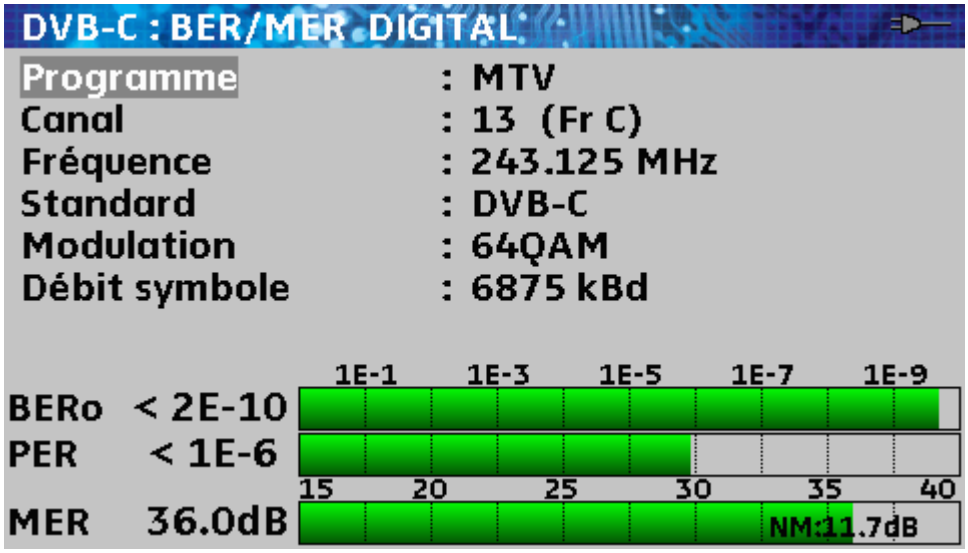
- number of carrier waves (8 K)
- constellation (64QAM)
- guard interval (1/32 auto)
- Viterbi rate (2/3)
- spectrum inversion.

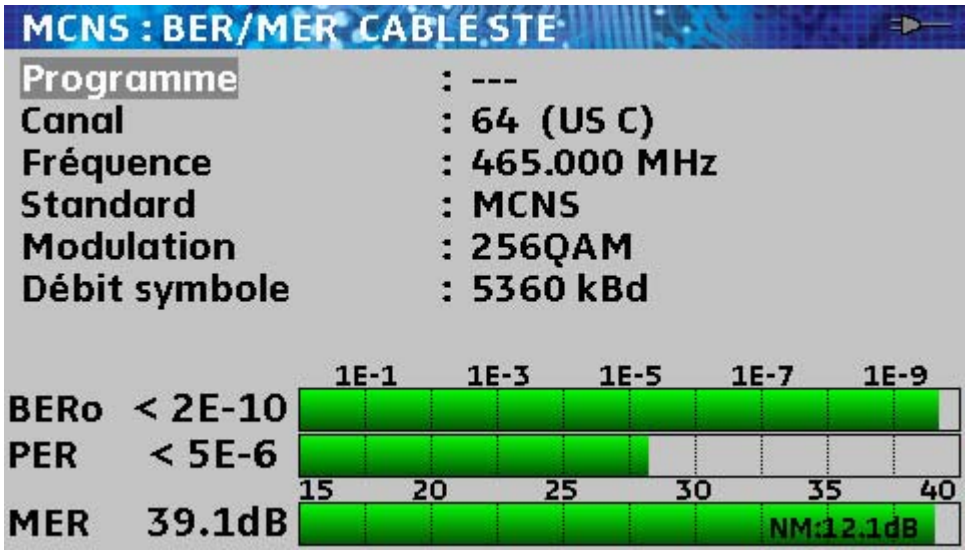
In case of poor quality signal or co-frequent analogical signal, you'd better choose the manual front guard interval mode. To do this, you had to change the "Modulation" parameter by choosing the good guard interval.

The display of the value of Cell_ID indicated by the provider and specific to the emitter.

9.2 DVB-C and MCNS (SPAROS SAT HD DVB-C only)







Display of the values:

- **BERo** : error rate before Reed Solomon
- **PER** : error rate after Reed Solomon (packet error rate)
- **MER** : modulation error rate
- **NM**: noise margin

BERo: 'bits' error rate

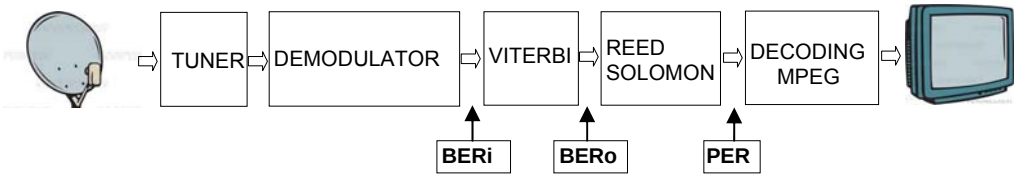
Ratio of the number of erroneous bits / number of transmitted bits during the measuring time

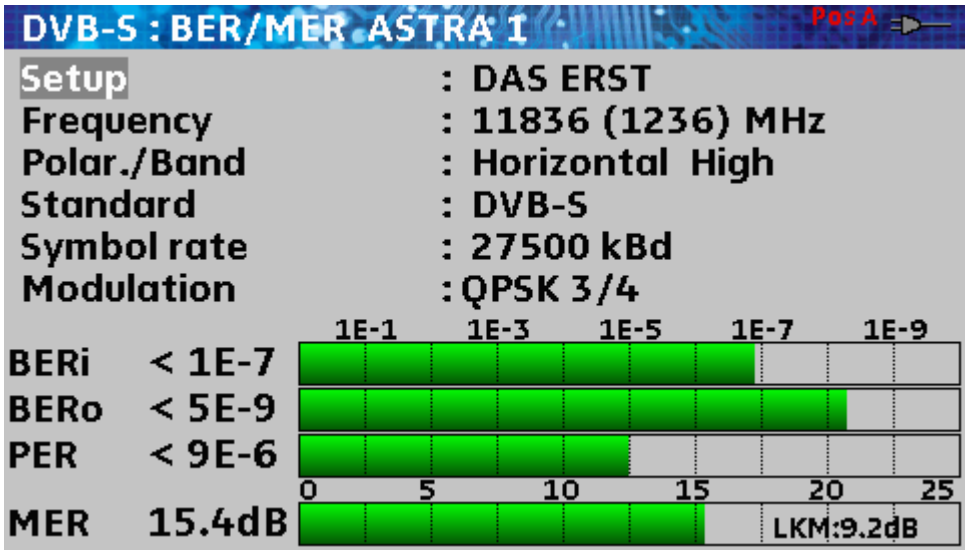
PER: 'packets' error rate

Ratio of the number of erroneous packets / number of transmitted packets during the measuring time

Remember: a packet in DVB-C is made of 204 bytes; a packet is 'wrong' if it includes more than 8 wrong bytes (correction by Reed Solomon coding).

9.3 DVB-S and DSS





Display of the values:

- **BERi** : error rate before Viterbi
- **BERo** : error rate after Viterbi
- **PER** : error rate after Reed Solomon (packet error rate)
- **MER** : modulation error rate
- **LKM**: link margin

BERx: 'bits' error rate

Ratio of the number of erroneous bits / number of transmitted bits during the measuring time

PER: 'packets' error rate

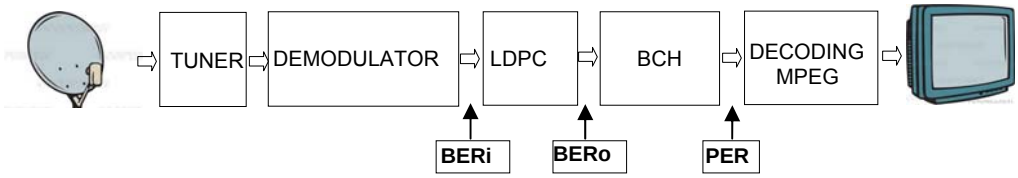
Ratio of the number of erroneous packets / number of transmitted packets during the measuring time

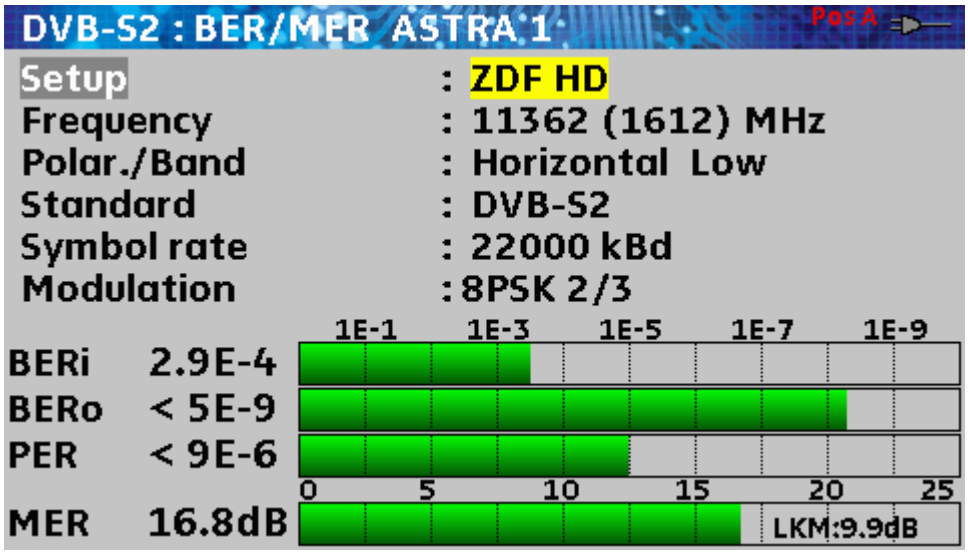
Remember: a packet in QPSK (DVB-S) is made of 204 bytes; a packet is 'wrong' if it includes more than 8 wrong bytes (correction by Reed Solomon coding). In DSS, a packet is made of 146 bytes.

Display of the detected **Modulation** type:

- the constellation (QPSK)
- the Viterbi rate (3/4)

9.4 DVB-S2





Display of the values:

- **BERi** : error rate before LDPC
- **BERo** : error rate after LDPC
- **PER** : error rate after BCH (lost packets)
- **MER** : modulation error rate
- **LKM**: link margin

Remember:

LDPC: Low Density Parity Check

BCH: Bose Chauhuri Houquenohem

In DVB-S2, the concatenation LDPC + BCH has replaced the concatenation Viterbi + Reed Solomon of the correction of the DVB-S.

Display of the detected **Modulation** type:

- the constellation (8PSK)
- the Viterbi rate (2/3)

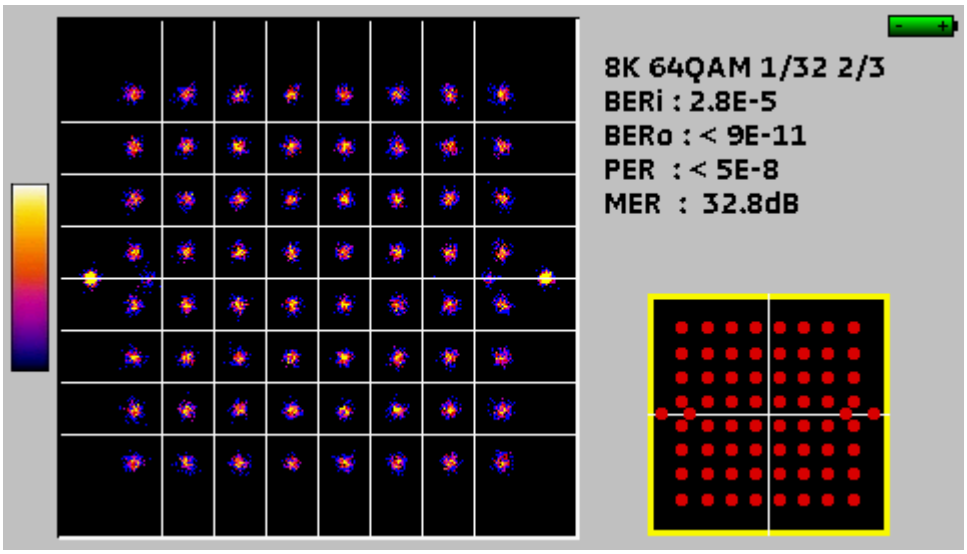
10 Constellation

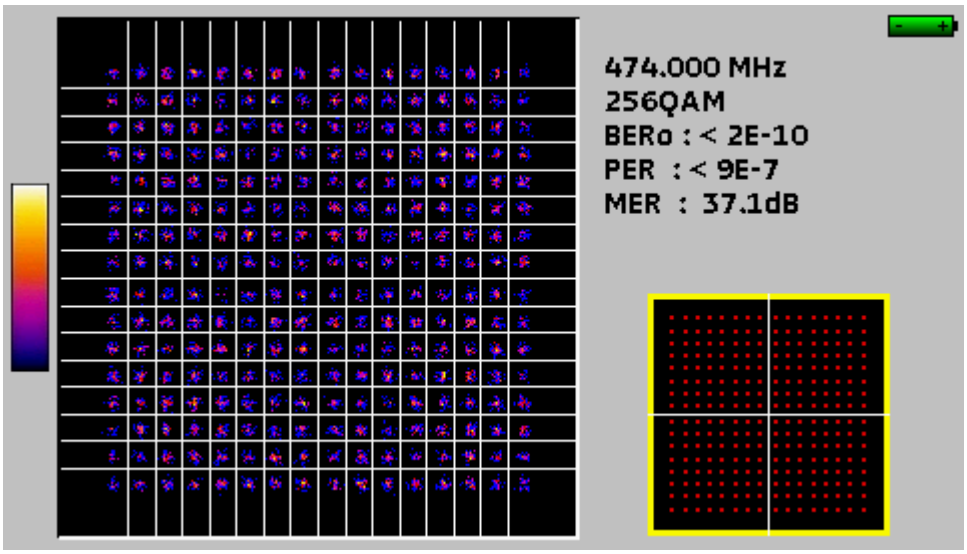
Pushing several times on the Measurement key give you access to the **Constellation** function.

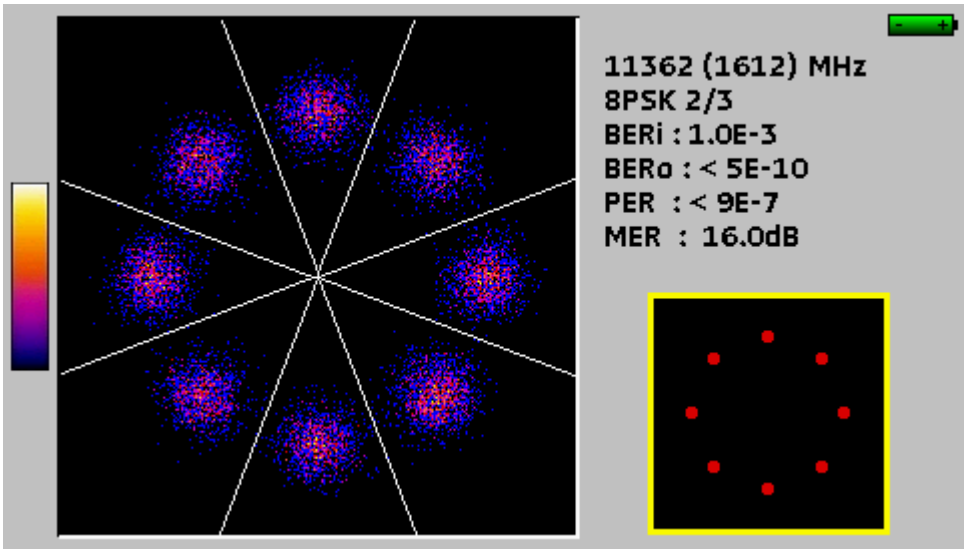
These measurements are available if one of these standards is running in the **Level measurement** page.

- DVB-T/H (SPAROS SAT HD DVB-T/H)
- DVB-C, MCNS (SPAROS SAT HD DVB-C)
- DVB-S, DSS, DVB-S2 (each SPAROS SAT HD model)

The appliance displays the **Constellation** of the current signal.







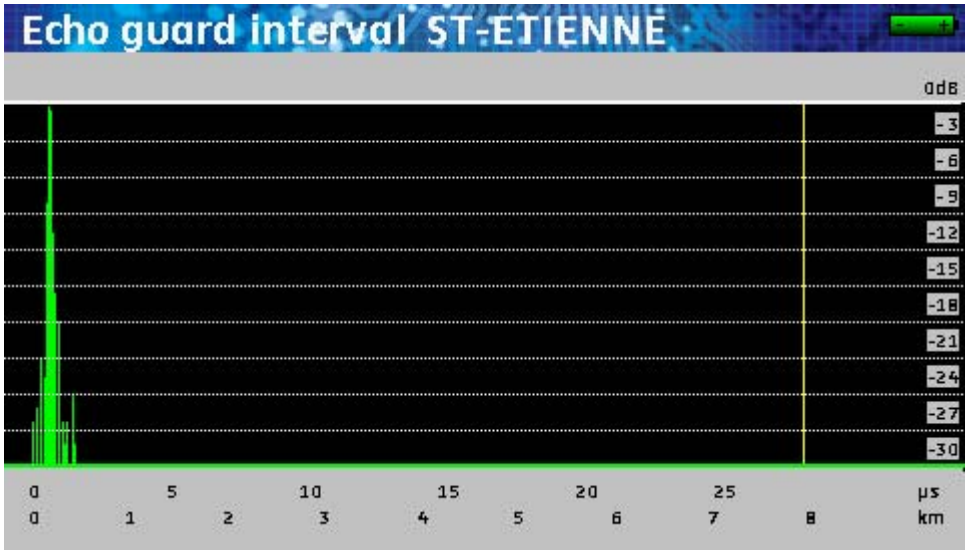
Informations on the right of the **Constellation** diagram are the same as in the **Error rate** function:

- current frequency
- constellation
- symbol rate
- error rate and MER.

11 Echo - Guard interval (SPAROS SAT HD DVB-T)

	Only available if the current standard is DVB-T/H and if the appliance is SPAROS SAT HD DVB-T.

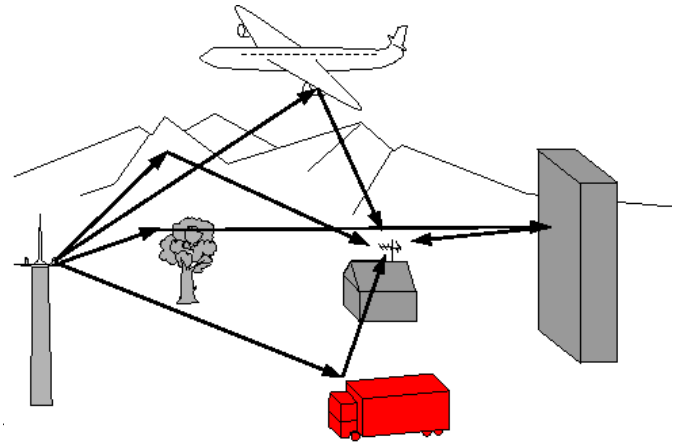
Pushing several times on the Measurement key give you access to the **ECHO** function.



The Validation key enables you to change the horizontal scale.

A yellow line marks the end of the guard interval.

Remember: In terrestrial TV broadcasting, the received signal on the antenna comes from several possible ways: the **echoes**.



In analogical TV, these echoes disturb the reception and degrade the image.

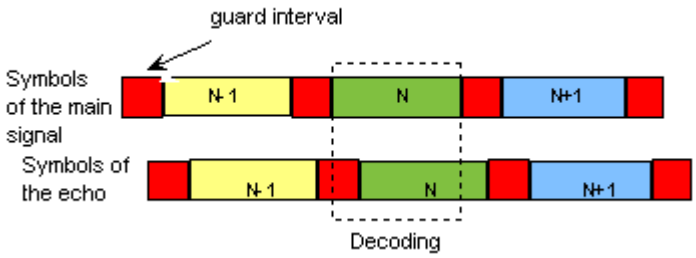
In digital TV DVB-T, these echoes may help or degrade the image according to the time delay between the various signals that reach the antenna.

The broadcasting norm DVB-T defines a modulation parameter called "**guard interval**" where echoes won't disturb the reception.

The transmission of digital data (**Symbol**) is interrupted during the **guard interval**.

A delayed (or advanced) symbol of any **shorter** duration than the guard interval will not disturb the reception.

A delayed (or advanced) symbol of any **longer** duration than the guard interval will disturb the reception.



You have to reduce the level of reception of the echoes by orienting the antenna or by selecting a more directive antenna.

The **Echo** function of the appliance enables you to display possible **echoes** that disturb the received signal.

You can assess the relative amplitude in dB and the delay in µs (distance in km) in comparison with the main signal (0 pulse).

The yellow line shows the end of the interval guard.

The echoes (rays) beyond this line disturb the reception and must be as weak as possible.

12 Measurement map

Pushing several times on the Measurement key give you access to the **Measurement map** function.

This is an automatic measurement of the level and of the error rate of the setups in the list of measurements with an indication of the levels out of tolerance.

Measurement map ST-ETIENNE

freq.	std	RF	C/N	BERi	BERo	PER	MER
E50	DVB-T/H	56.6	>45.9	4.3E-5	<9E-8	<9E-5	33.0
E23	DVB-T/H	56.4	>42.0	5.4E-5	<9E-8	<9E-5	28.5
E39	DVB-T/H	60.1	>43.6	1.0E-4	<9E-8	<9E-5	32.8
E54	DVB-T/H	58.8	>44.4	2.5E-5	<9E-8	<9E-5	32.7
E29	DVB-T/H	51.0	>38.6	3.4E-4	<9E-8	<9E-5	27.8
E26	DVB-T/H	54.0	>46.6	1.6E-4	<9E-8	<9E-5	27.8
E35	L	69.6	>57.1				
E30	L	62.8	>55.3				
E33	L	68.0	>57.1				

1/15 .....

Measurement map ASTRA NUM

freq.	std	RF	C/N	BERi	BERo	PER	MER
11836 HL	DVB-S	72.0	12.4	8.2E-6	<5E-9	<9E-6	14.1
11568 VL	DVB-S	74.7	10.0	Sync?	Sync?	Sync?	--.-
11597 VL	DVB-S	74.2	10.0	<1E-7	<5E-9	<9E-6	15.7
11817 VH	DVB-S	74.4	12.7	1.6E-7	<5E-9	<9E-6	15.0
12552 VH	DVB-S	71.1	11.0	<1E-7	<5E-9	<9E-6	15.9
11954 HH	DVB-S	74.7	13.1	3.8E-5	<5E-9	<9E-6	13.1
12324 VH	DVB-S	72.9	10.3	3.6E-5	<5E-9	<9E-6	13.1

2/11 ..

BERi, **BERo** and **PER** are generic acronyms (frequently used)

BERi = BER in = inner BER
first BER treated by the demodulator (BER channel, CBER, LDPC)

BERo = BER out = outer BER
last BER treated by the demodulator (BER Viterbi, VBER, BCH)

PER = packet error rate
uncorrected packet, lost packet, erroneous packet (UNC, PER)

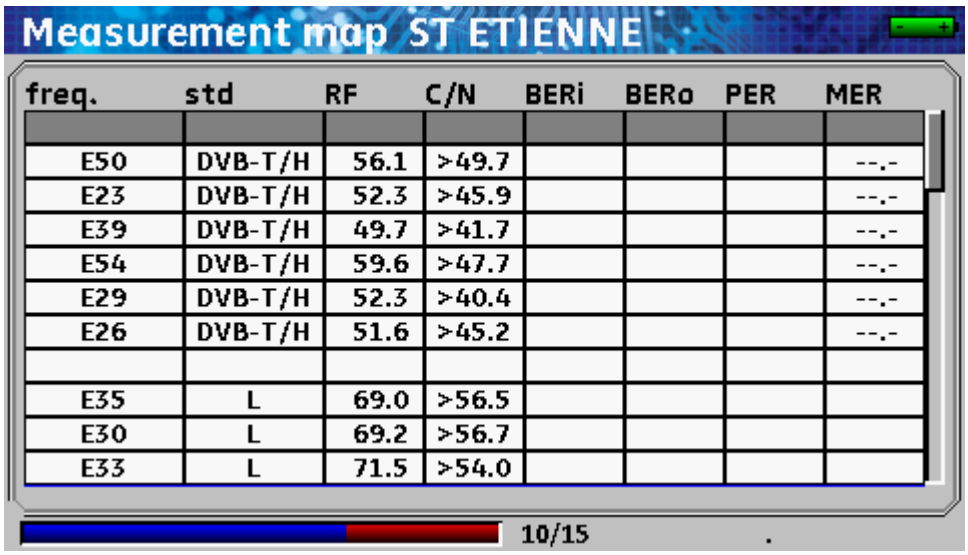
Important

A bar graph below the Measurement map allows you to observe the progression of the scan.

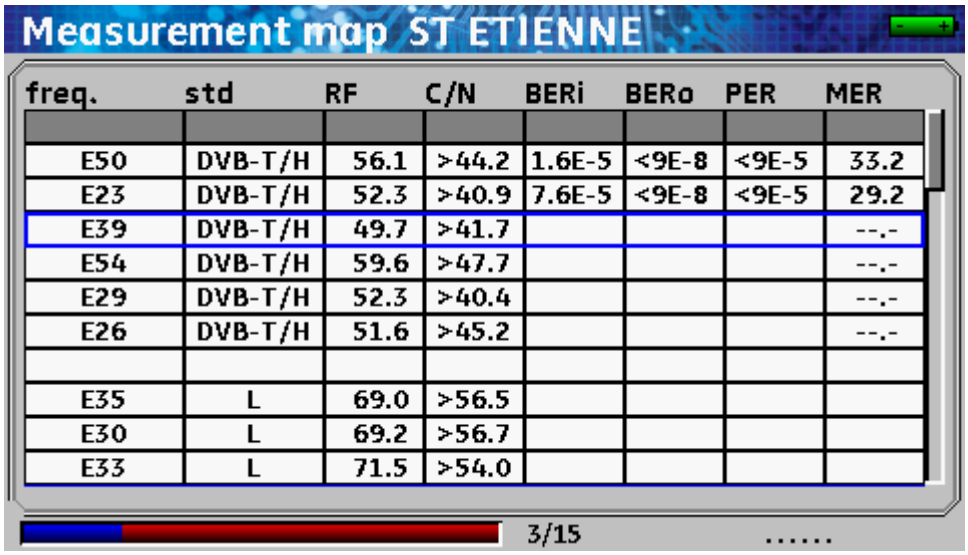
The **background** colour of this bar graph tells you that a complete scan has been made (for example for a save):

- **red**: the Measurement plan has not been totally scanned
- **green**: the Measurement plan has been totally scanned

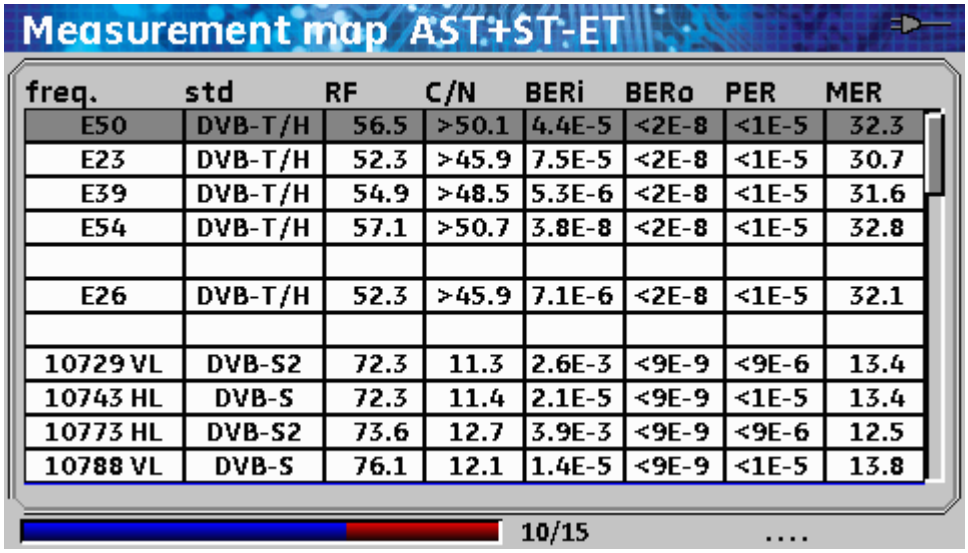
For a quick view, only the levels and C/N of each Setup are measured at the first scan.



Then, the error rates of the Setups under the digital standards are measured.



SPAROS SAT HD DVB-C and SPAROS SAT HD DVB-T allows mixing satellite and terrestrial setups:

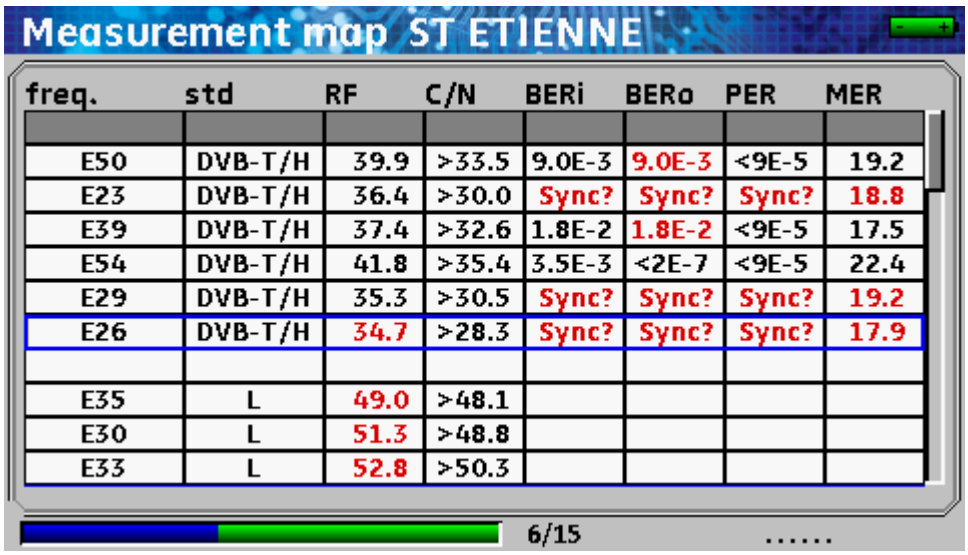


In this case, satellite remote supply has the first priority. (Terrestrial remote supply is ignored)

12.1 Values out of tolerance

A coloured frame around the values changes according to the decision **Thresholds**:

- **red** for values below the **min**. **Threshold**
- orange for values above the **max. Threshold**



13 Image and Sound

Pushing the TV key gives you access to the **Image and Sound** function.

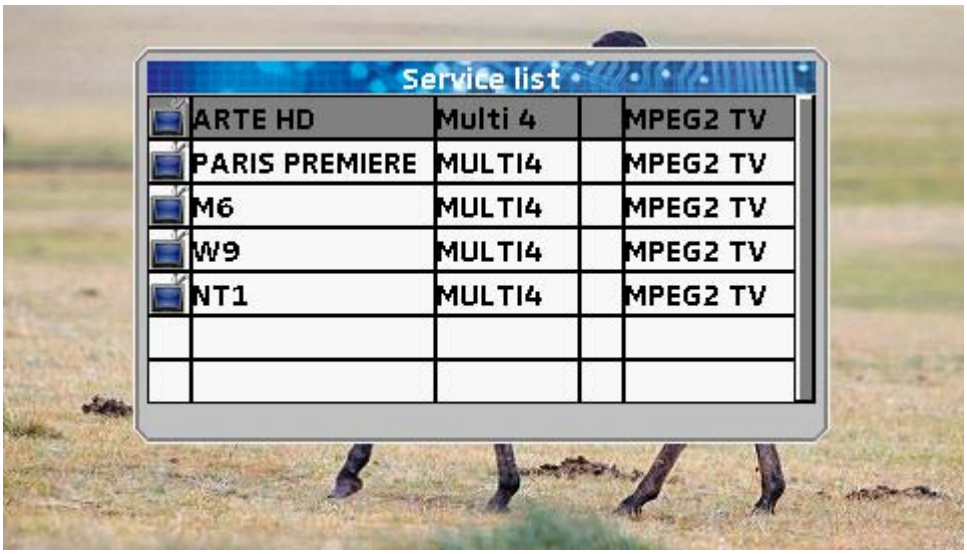
13.1 Digital TV

The name of the service and its main characteristics are displayed on the right top of the screen.

- 1440x1080i : resolution of the picture 1440 pixels / line, 1080 lines, interlace scan
- 25 Hz : frame frequency
- H.264 : picture compression
- Video Rate 7.455 MBits/s : snapshot binary rate of the service
- Audio MPEG Layer II : sound compression

13.2 Service list

Pushing twice on the TV key gives you access to the list of services



Use the knob and the Validation key to change of service

The provider and the type of service are specified

TV

Radio

Data

Encrypted service

13.3 Setup change

Pushing three times on the TV key

enables you to change the setup.

Use the Validation key, then use the knob to change of setup

13.4 Audio

The appliance can decode the following digital sounds:

MPEG-1 L1/L2

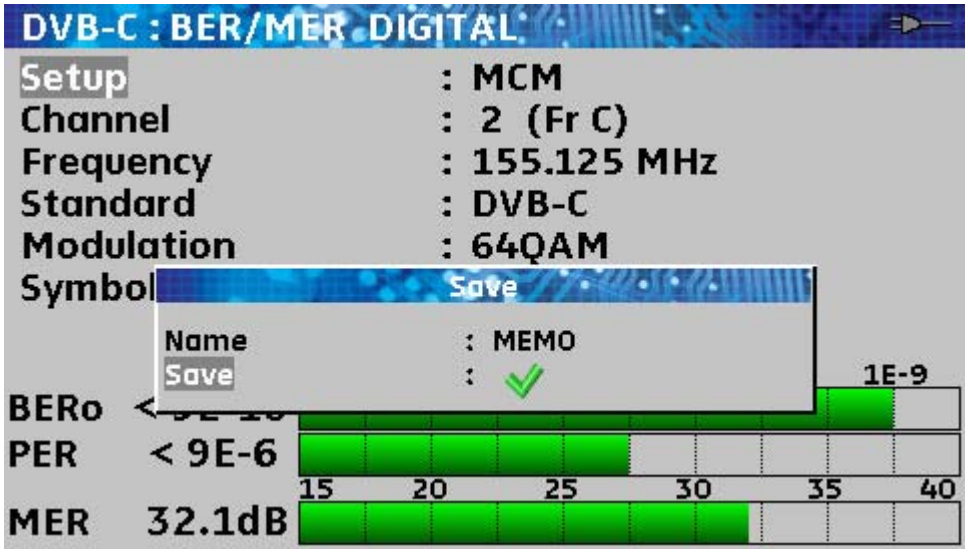
AAC	Advanced Audio Coding	License Via Licensing
HE-AAC	High Efficiency AAC	License Via Licensing
Dolby Digital		License Dolby®
Dolby Digital Plus		License Dolby®

Produced under **licence** of **Dolby** Laboratories.

Dolby and the double-D symbol are trademarks of **Dolby Laboratories**.

14 Saving

Pushing the Toolbox key enables you to **Save** the measurement values.



	You will be able to use the saved values, after transfer, to create measurement reports on your computer (see the Memories paragraph for more details).

A window opens on the current screen and suggests a file name.

You can directly **Save** a file using the suggested name or change it.

After changing the file name, move to the Save line and push the Validation key.

See the Acquisition of a name paragraph for more details.

	When you turn off the appliance, the complete shut-off will last a few seconds because of a saving on a flash memory.

15 Remote supply / LNB – DiSEqC

Pushing several times on the Toolbox key give you access to the configuration of the remote supply:

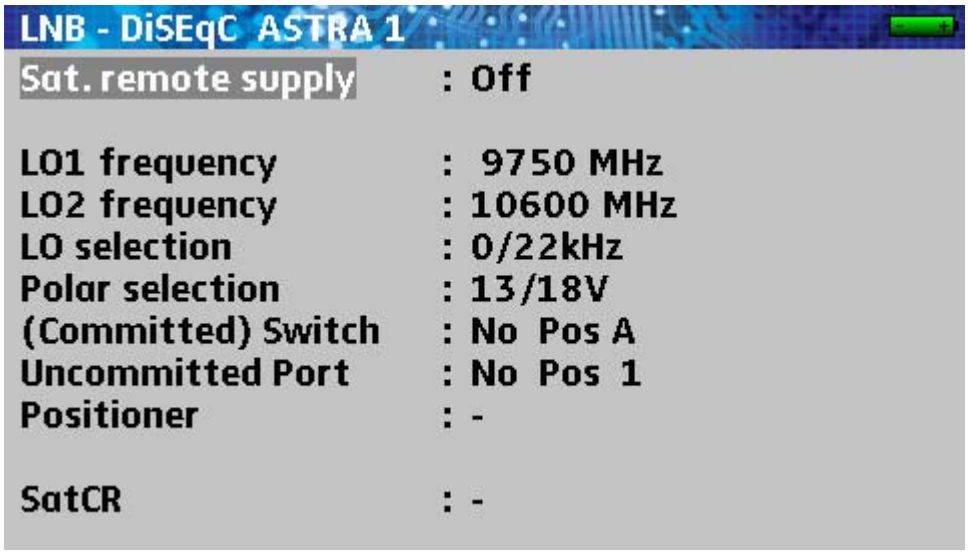
15.1 Terrestrial band (SPAROS SAT HD DVB-C & DVB-T/H)

Remote supply: on / off

Selection of the voltage of the remote supply among the values: 5V, 13V, 18V and 24V

See the Man-machine interface chapter for any modification.

15.2 Satellite band (each SAPROS SAT HD model)

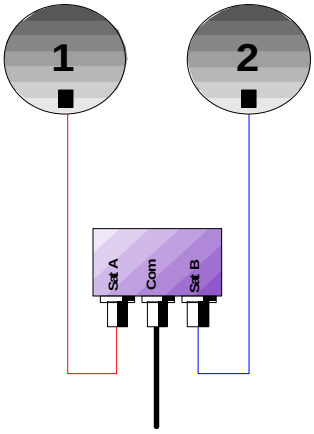

LNB - DiSEqC ASTRA 1
Sat. remote supply : Off
LO1 frequency : 9750 MHz
LO2 frequency : 10600 MHz
LO selection : 0/22kHz
Polar selection : 13/18V
(Committed) Switch : No Pos A
Uncommitted Port : No Pos 1
Positioner : -
SatCR : -

Configuration lines:

- Remote supply : turns on/off the remote supply or automatic mode
- OL1 frequency : OL frequency lower band of the LNB
- OL2 frequency : OL frequency higher band of the LNB
- OL selection : band commutation on the LNB (22kHz, ToneBurst or DiSEqC)
- Polar selection : polarization commutation on the LNB (13/18V or DiSEqC)
- Switch : switch, type and position (Name, ToneBurst, 22 kHz, DiSEqC, Pos A, B, C or D)
- Uncommitted : "uncommitted" switch, type et position (No, DiSEqC, Pos 1 to 16)
- Positioner : Presence of a positioner (Yes / No)
- Satellite # : Current position (from 1 up to 127 pre-loaded positions in the positioner)
- SatCR : SatCR mode (single cable distribution)

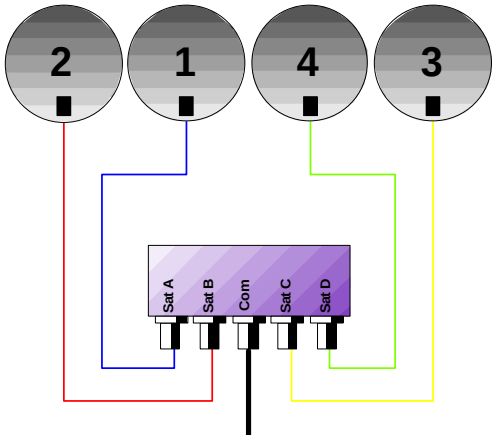
See the Man-machine interface chapter for any modification.

15.2.1 Switches



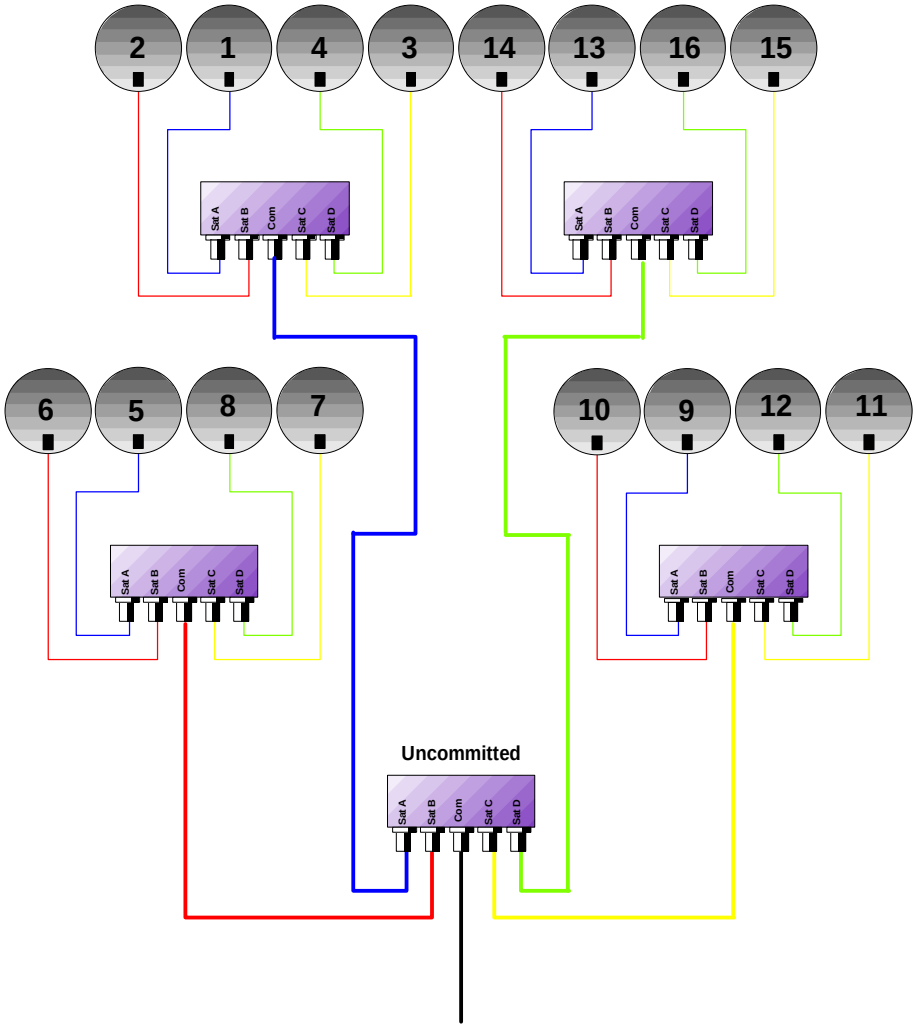
2-satellite switch

* 22 kHz
* ToneBurst (MiniDiSEqC)
*DiSEqC Committed or Uncommitted



4-satellite switch

* DiSEqC Committed or Uncommitted



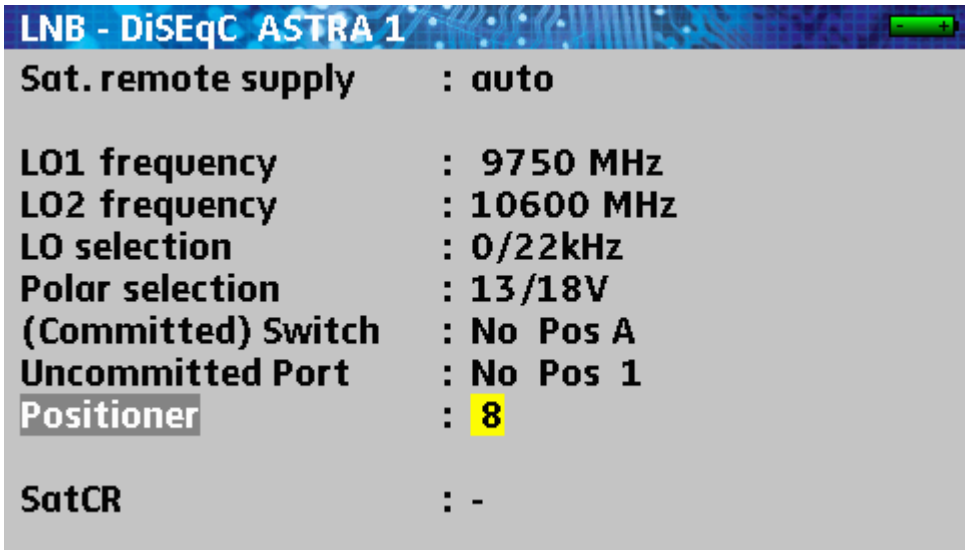
16-satellite switches

* DiSEqC Committed + Uncommitted

	Switch line		Uncommitted line	
Satellite	Position	Command DiSEqC	Position	Command DiSEqC
1	Pos A	Option A + Position A	Pos 1	Input 1
2	Pos B	Option A + Position B	Pos 1	Input 1
3	Pos C	Option B + Position A	Pos 1	Input 1
4	Pos D	Option B + Position B	Pos 1	Input 1
5	Pos A	Option A + Position A	Pos 2	Input 2
6	Pos B	Option A + Position B	Pos 2	Input 2
7	Pos C	Option B + Position A	Pos 2	Input 2
8	Pos D	Option B + Position B	Pos 2	Input 2
9	Pos A	Option A + Position A	Pos 3	Input 3
10	Pos B	Option A + Position B	Pos 3	Input 3
11	Pos C	Option B + Position A	Pos 3	Input 3
12	Pos D	Option B + Position B	Pos 3	Input 3
13	Pos A	Option A + Position A	Pos 4	Input 4
14	Pos B	Option A + Position B	Pos 4	Input 4
15	Pos C	Option B + Position A	Pos 4	Input 4
16	Pos D	Option B + Position B	Pos 4	Input 4

15.2.2 Positioner

The appliance produces a DiSEqC command that orders the rotation of a motorized dish.


LNB - DiSEqC ASTRA 1
Sat. remote supply : auto
LO1 frequency : 9750 MHz
LO2 frequency : 10600 MHz
LO selection : 0/22kHz
Polar selection : 13/18V
(Committed) Switch : No Pos A
Uncommitted Port : No Pos 1
Positioner : 8
SatCR : -

Current position (from 1 up to 127 pre-loaded positions in the positioner): if the window shows a "–", the positioner is deactivated

See the Man-machine interface chapter for any modification.

15.2.3 SatCR mode

Description:

SatCR: Satellite Channel Router or Single Cable Distribution

Distribution of the satellite signal with only one coaxial cable in one-family house to 2, 4 or 8 different receptors.

You need a **coaxial cable per receptor** and a suitable installation (multiple LNB, Quattro and multi-switches) to give access to the whole spectrum and all polarizations to several receptors.

The SatCR mode is an extension of the DiSEqC protocol that enables the connection of several receptors on **only one coaxial cable**, no matter the band (H/L) and the polarization (H/V).

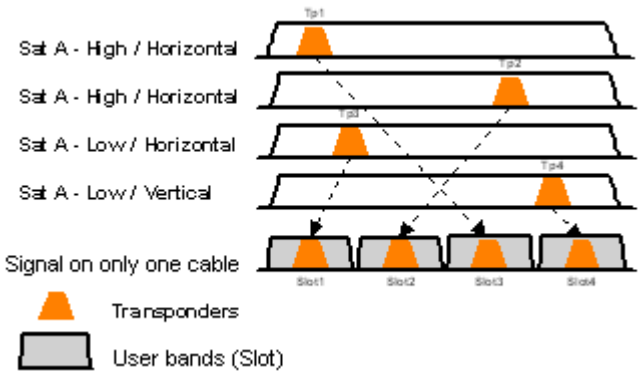
There is a norm for the European industry for the broadcasting of the satellite signals on only one cable - **EN50494**.

Functioning:

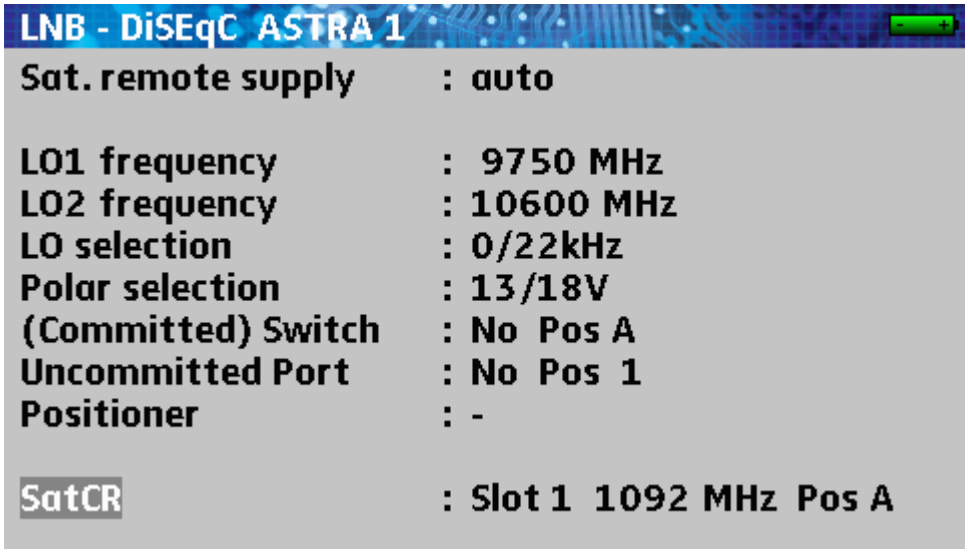
Each satellite receptor uses a fixed frequency band (**Slot** or **Port**), whose width is (more or less) equal to the transponder frequency bandwidth.

The receptor requires a specific transponder frequency (Ku frequency) via a DiSEqC command.

Some equipment at the dish (LNB or switch SatCR) moves the requested signal to the middle of the selected band (**Slot**). Then, the mixing equipment adds each user band (**Slot**) on only one output (up to 8 user bands).


Sat A - High / Horizontal
Sat A - High / Horizontal
Sat A - Low / Horizontal
Sat A - Low / Vertical
Signal on only one cable
Transponders
User bands (Slot)

Use:


LNB - DiSEqC ASTRA 1
Sat. remote supply : auto
LO1 frequency : 9750 MHz
LO2 frequency : 10600 MHz
LO selection : 0/22kHz
Polar selection : 13/18V
(Committed) Switch : No Pos A
Uncommitted Port : No Pos 1
Positioner : -
SatCR : Slot 1 1092 MHz Pos A

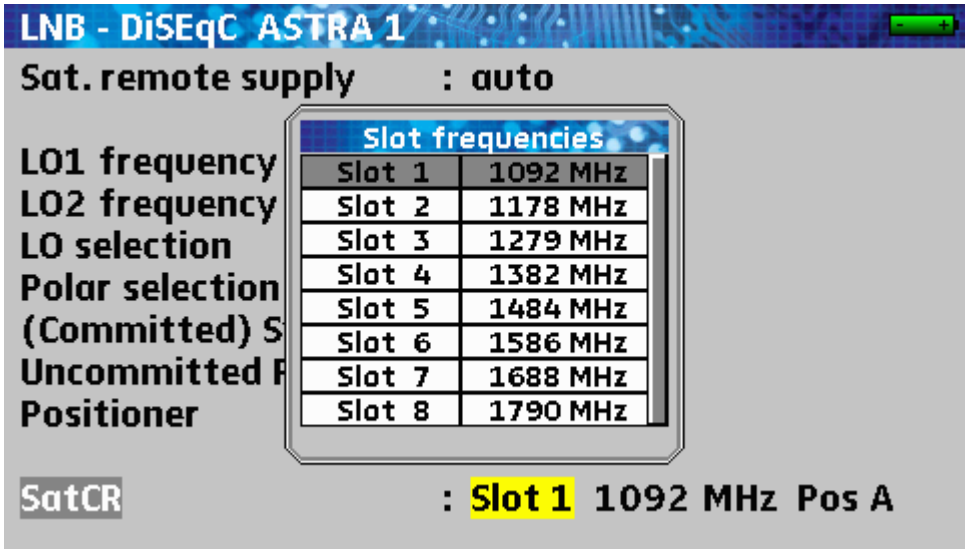
SatCR line:

- Slot 1 : selection of the SatCR slot; if the window shows a "–", the positioner is deactivated
- 1180 MHz : access to the adjustment of the frequency of the slots
- Pos A : selection of switch Pos A / Pos B

See the Man-machine interface chapter for any modification.

	The SatCR mode has priority over any other mode: polarization selection, OL selection, committed switches, uncommitted switches and positioner.

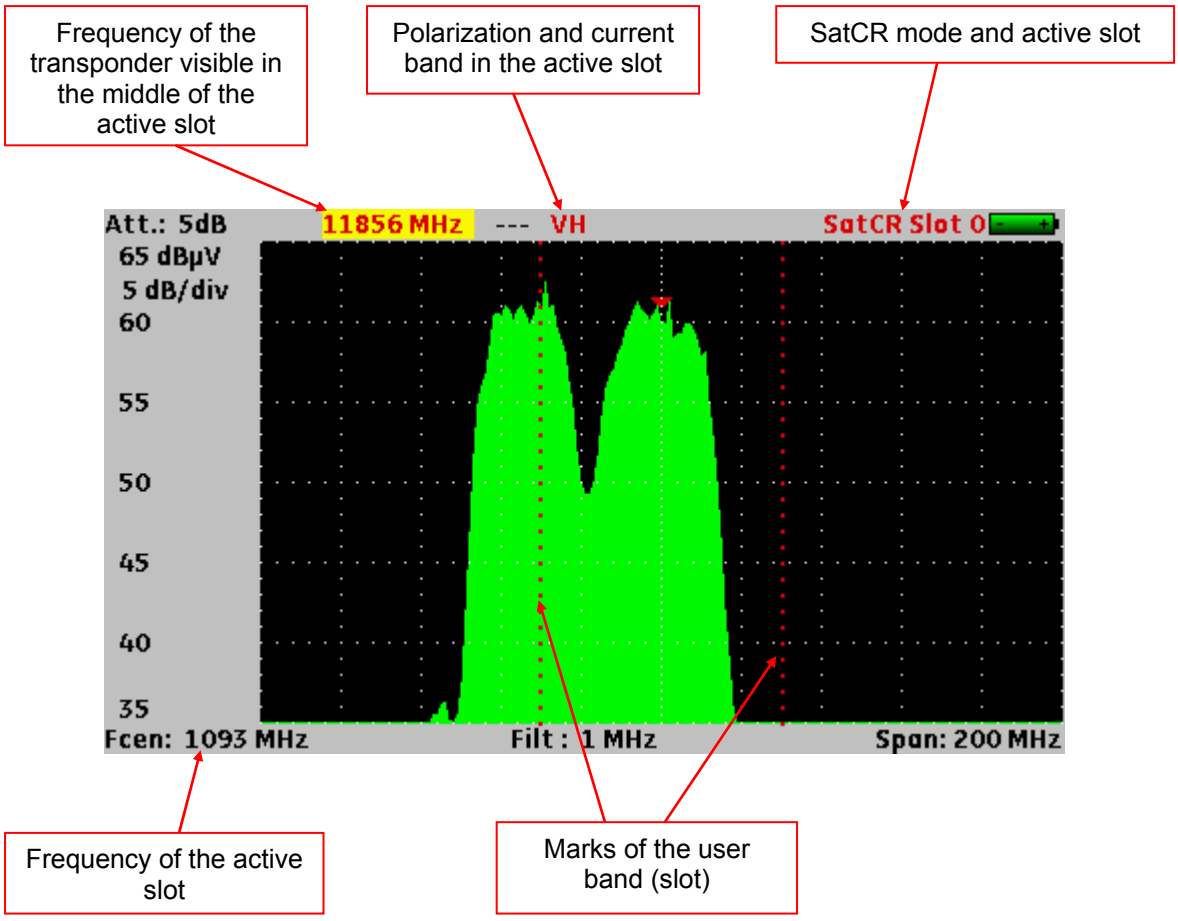
15.2.3.1 Automatic research of the frequencies of slots



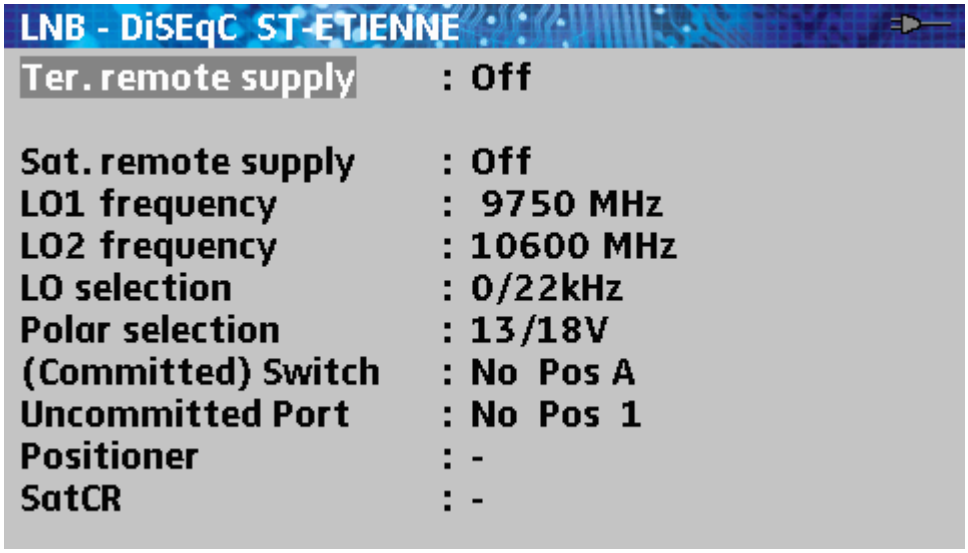
Push the Toolbox key: the list of all slot frequencies appears

Push the Toolbox key twice: an automatic research of these frequencies starts; the list is automatically completed

15.2.3.2 Influence of the SatCR mode on the spectrum analyzer



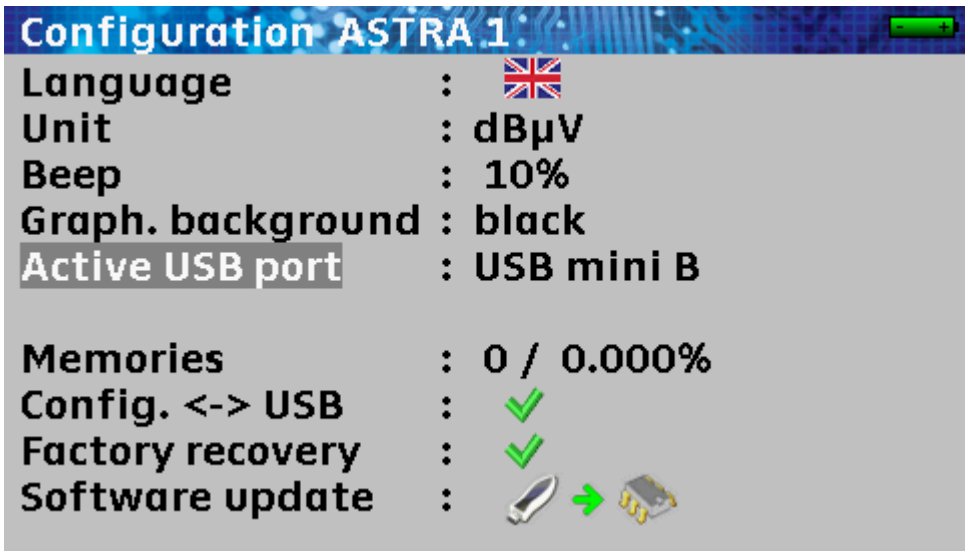
15.3 Terrestrial + satellite band


LNB - DiSEqC ST-ETIENNE
Ter. remote supply : Off
Sat. remote supply : Off
LO1 frequency : 9750 MHz
LO2 frequency : 10600 MHz
LO selection : 0/22kHz
Polar selection : 13/18V
(Committed) Switch : No Pos A
Uncommitted Port : No Pos 1
Positioner : -
SatCR : -

	In measurement map mode (with satellite and terrestrial setups at the same time), satellite remote supply has the first priority (Terrestrial remote supply is ignored).

16 Configuration

Pushing several times on the Toolbox key give you access to the general **Configuration** of the appliance:



16.1 Language

Use the knob to change it.

16.2 Measurement unit

Use the knob to change it:

- **dBµV**: 0 dBµV matches 1 µV
- **dBmV**: 0 dBmV matches à 1 mV
- **dBm**: 0 dBm matches 274 mV : 1 mW in case of 75Ω impedance
- **V**: value in V, mV and µV according to the level

16.3 Sound level of the beep for the keys and the plotting

Use the knob to change it.

16.4 Background colour of the graphical pages

Use the knob to change the background colour of the graphs: **black**, **white** or **grey** (spectrum, constellation…)

This function spares ink from the printer when editing the reports.

16.5 Active USB port

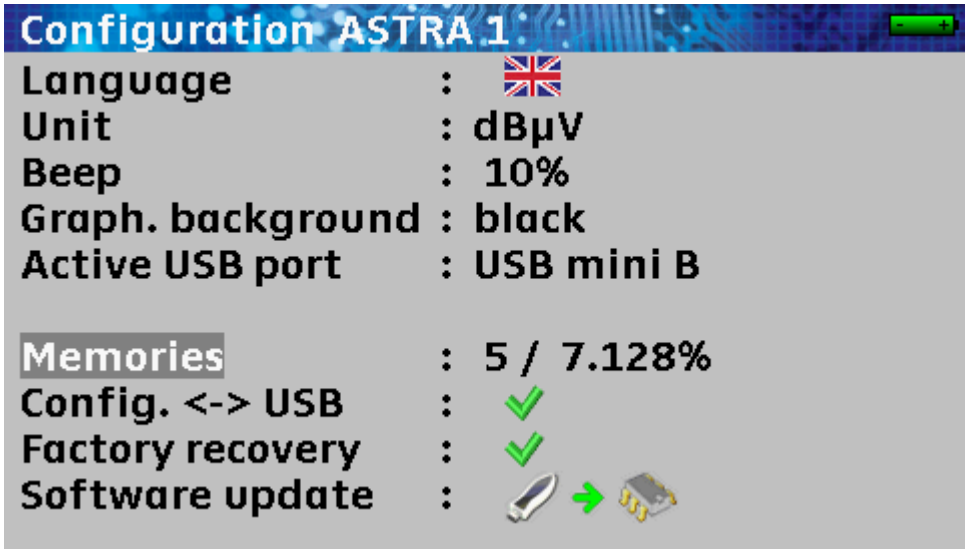
Use the knob to change it.

USB A: connection with an USB key for updating, configuration loading or memory issue.

USB mini B: connection with a computer via an adapted cable; the computer will recognize the appliance as an USB key: no driver is required.

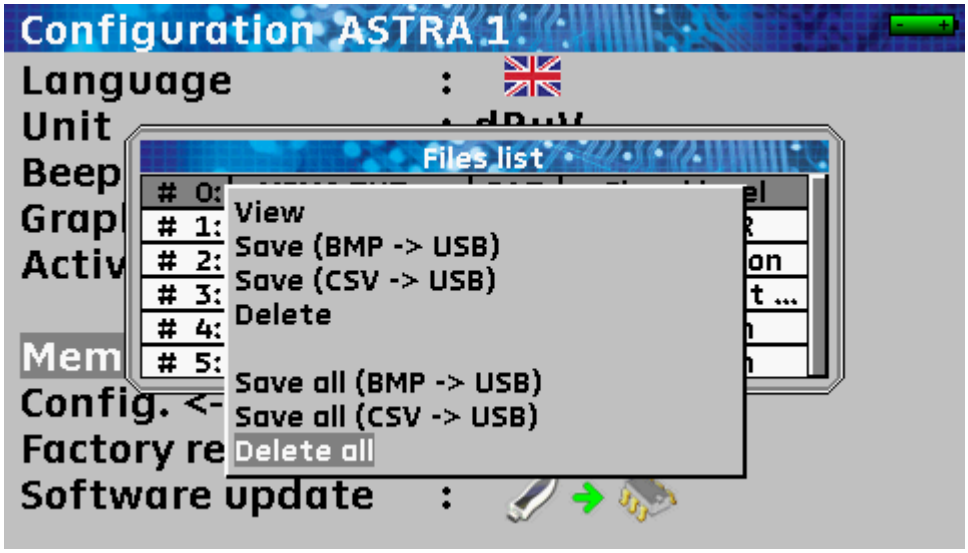
16.6 Memories

Display of the number of recorded files and their place in memory.



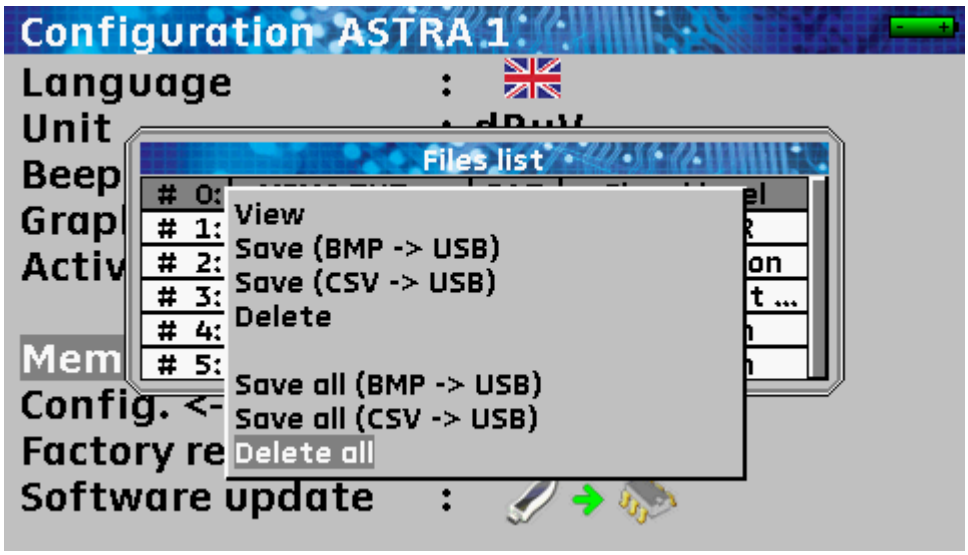
Pushing the Validation key unfolds the list of the previously recorded files.

The first column specifies the sequence number of the file; the second file specifies the name of the file; the third column specifies the TER terrestrial/cable measurement band or SAT satellite; the last column specifies the type of file: level, spectrum, measurement plan…

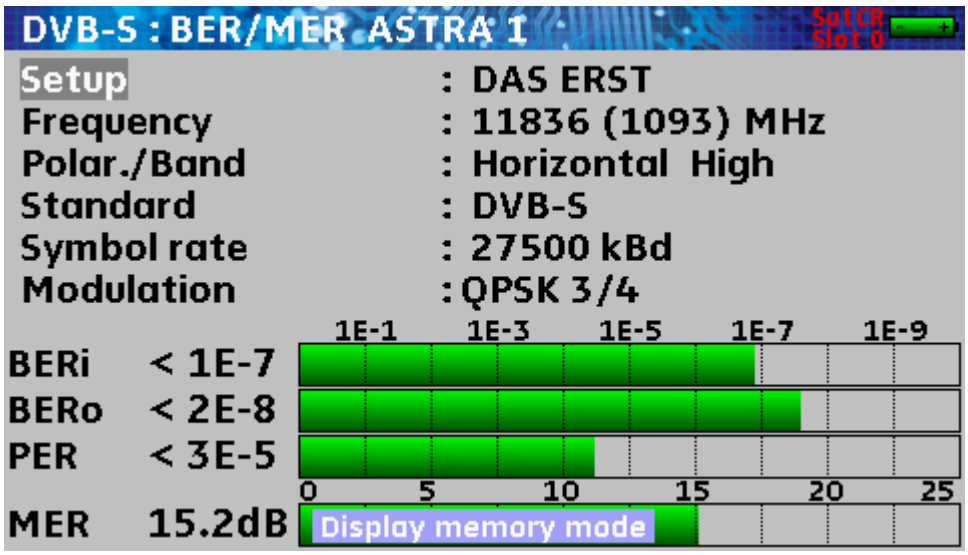


Rotate the knob to point at the file to work on. Pushing the Validation key

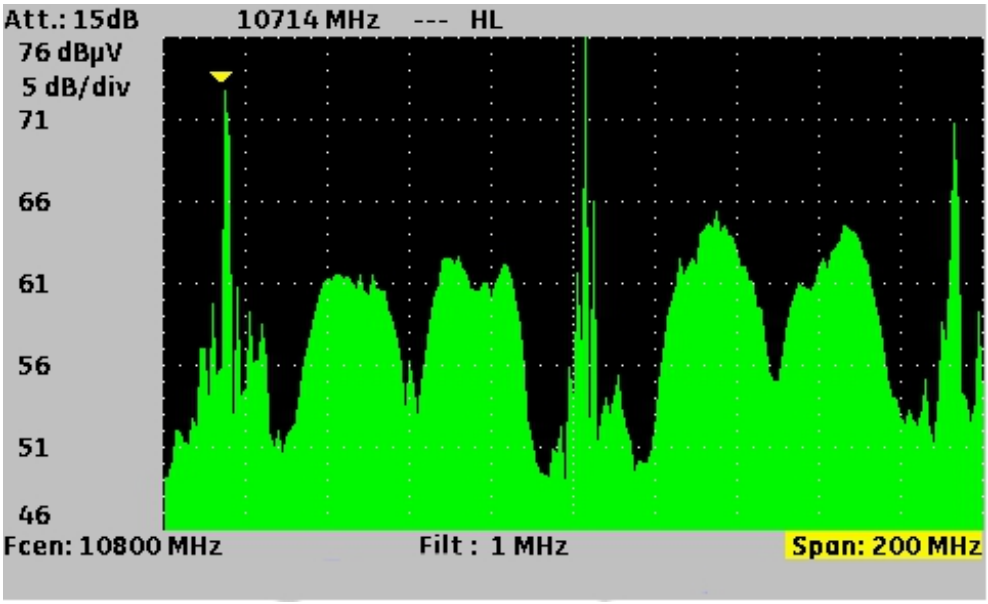
will display a list of possible actions.



View: Display of the content of the file

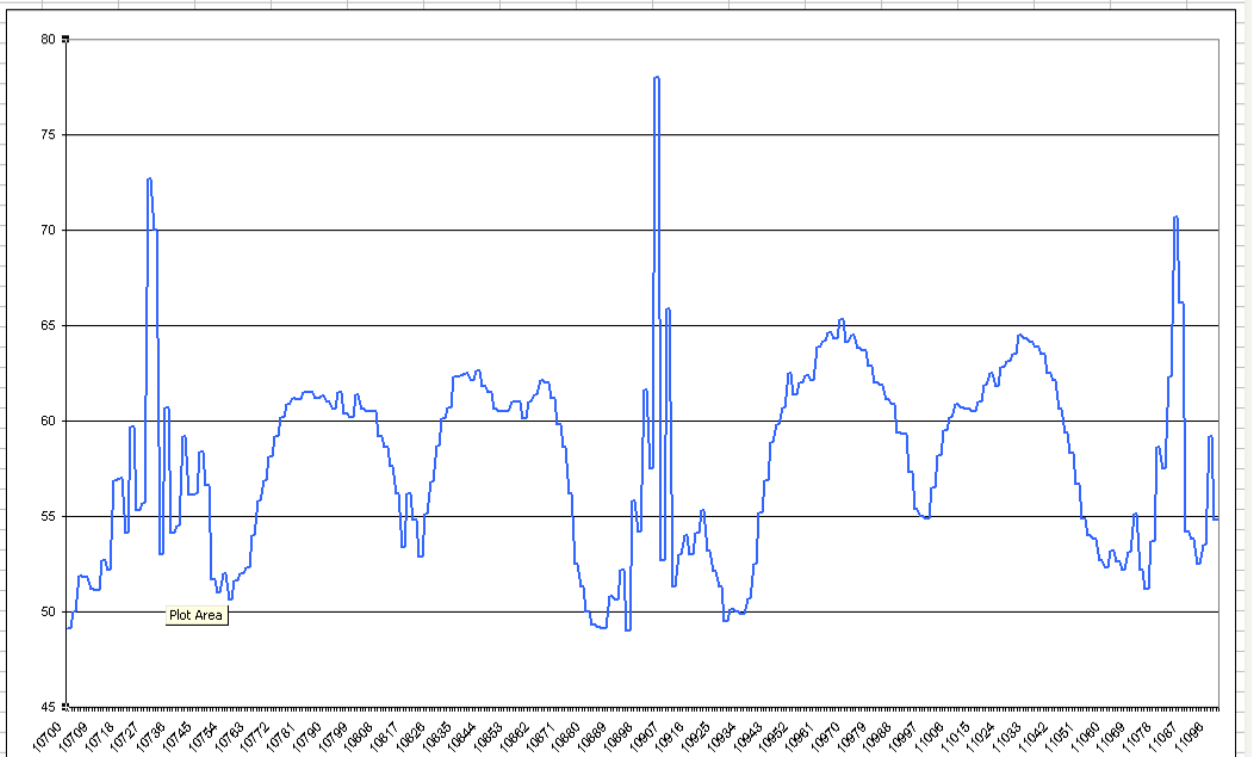


Save (-> USB BMP): exportation of the file to the USB key under BMP format (uncompressed graphical format) useful to import graphs into a report.



Save (-> USB CSV): exportation of the file to the USB key under CSV format (text file in columns separated with semicolons) useful to analyse values in a spreadsheet software.

	A	B
1	SEFRAM 7808 #20 MEM5.CSV	
2		
3	0 ASTRA 1	LO1 frequency: 9750 MHz LO2 frequency:10600 MHz LO selection:DiSEqC Polar selection:13/18V (Committed) Switch:DiSEqC Pos A Uncommitted Port:No Positioner:-
4		
5	Spectrum	
6		
7	#3 EXTRA TV ASTRA 1 10714 (964) MHz HL DVB-S 22000 kBd	
8		
9	Fcen:	10800 MHz
10	Filt :	1 MHz
11	Span :	200 MHz
12	Att. :	15dB
13	Fcurs :	10714 MHz
14		
15	Fr : (MHz)	dBµV
16	10700	49.1
17	10701	49.1
18	10702	50
19	10703	50
20	10704	51.9
21	10705	51.9
22	10706	51.8
23	10707	51.8
24	10708	51.2
25	10709	51.2
26	10710	51.1
27	10711	51.1
28	10712	52.7
29	10713	52.7
30	10714	52.2
31	10715	52.2
32	10716	56.9
33	10717	56.9
34	10718	57
35	10719	57
36	10720	54.1
37	10721	54.1
38	10722	59.7
39	10723	59.7
40	10724	55.3
41	10725	55.3
42	10726	55.7
43	10727	55.7
44	10728	72.7
45	10729	72.7
46	10730	70

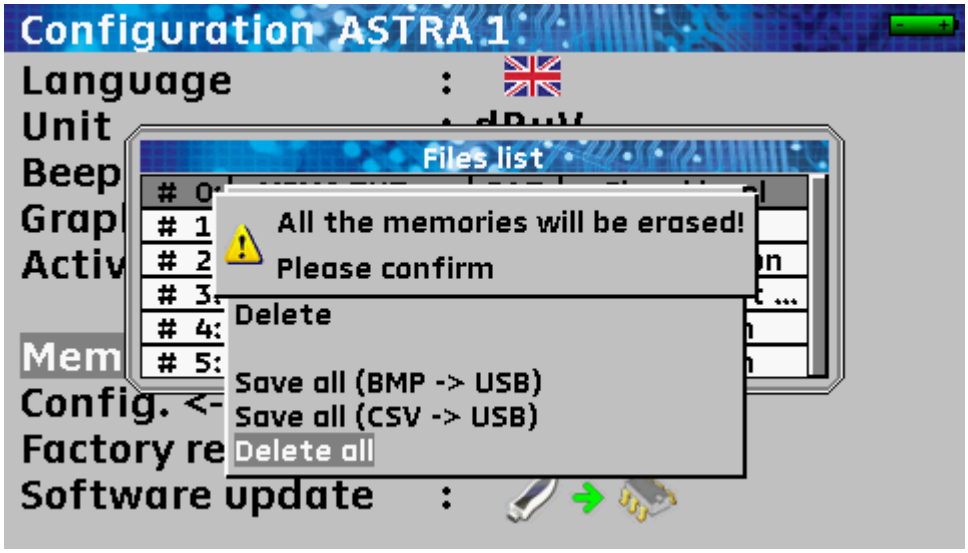


Save all (BMP -> USB): records all present files under BMP format into separated directories:

- LEVEL for level measurements
- MAP for measurement plans
- SPECTRUM for spectrum measurements
- BER-MER for measurements of error rates
- CONST for constellations
- ECHO for echoes.

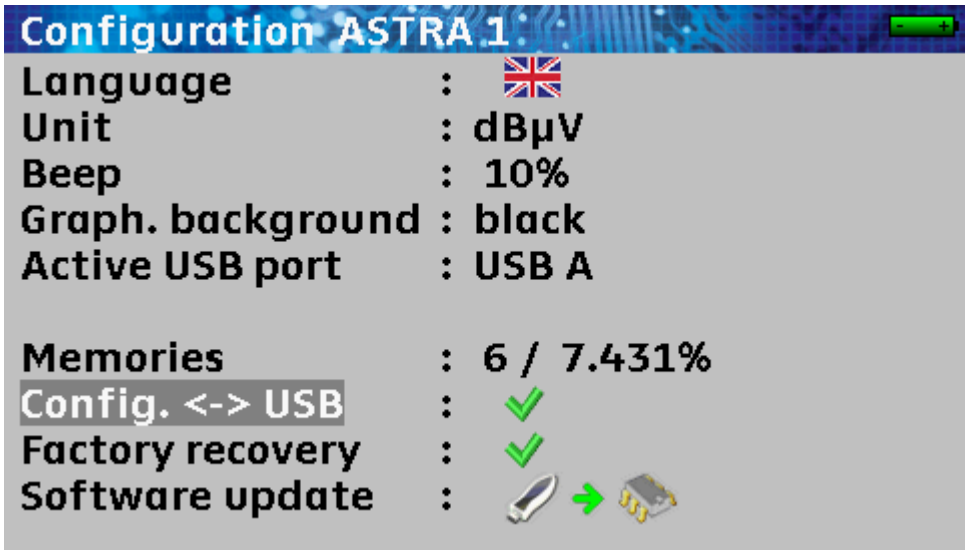
Save all (CSV -> USB): as previously, all files are recorded into directories, but under CSV format.

Delete: to erase the selected file
Delete all: to clean up the memory (with confirmation)



16.7 Configuration with USB key

You can update all or a part of the configuration of the appliance with a spreadsheet software and an USB key.



The configuration of the appliance is made of three different kinds of files:

- A satellite file for the plotting (see Dish adjustment)

		Transpondeur n° 1 / Transponder #1				Transpondeur n° 2 / Transponder #2				Transpondeur n° 3 / Transponder #3				Transpondeur n° 4 / Transponder #4			
	Nom du satellite Satellite name	Position orbitale Orbital position	Orientation	Fréquence Frequency	Polarisation Polarization	Standard	Débit symbole Symbol Rate	Fréquence Frequency	Polarisation Polarization	Standard	Débit symbole Symbol Rate	Fréquence Frequency	Polarisation Polarization	Standard	Débit symbole Symbol Rate	Fréquence Frequency	Polarisation Polarization	Standard	Débit symbole Symbol Rate
0	TURKSAT 2	42.0	E	11996	V	DVB-S	26000	12652	H	DVB-S	22500	11919	V	DVB-S	24444	11804	V	DVB-S	24444
1	ASTRA 2	28.2	E	10803	H	DVB-S	22000	10714	H	DVB-S	22000	10847	V	DVB-S	22000	12441	V	DVB-S	27500
2	ASTRA 3	23.5	E	10803	H	DVB-S	22000	12725	V	DVB-S	27500	11836	H	DVB-S	29900	11914	H	DVB-S	27500
3	ASTRA 1	19.2	E	11720	H	DVB-S	27500	12515	H	DVB-S	22000	10979	V	DVB-S	22000	12363	V	DVB-S	27500
4	EUTEL W2	16.0	E	11011	V	DVB-S	27500	11094	V	DVB-S	27900	11554	V	DVB-S	30000	12650	H	DVB-S	15000
5	HOT BIRD	13.0	E	10723	H	DVB-S	29900	12731	H	DVB-S	27500	10719	V	DVB-S	27500	12713	V	DVB-S	27500
6	INTL 10 02	1.0	W	12563	H	DVB-S	27500	12719	V	DVB-S	18400	12735	V	DVB-S	8800	12687	H	DVB-S	27500
7	ATLANTIC 3	5.0	W	12711	H	DVB-S	30000	12543	H	DVB-S	27500	11591	V	DVB-S	20000	12615	H	DVB-S	8789
8	ATLANTIC 2	8.0	W	11057	H	DVB-S	27500	11387	H	DVB-S	24740	12566	V	DVB-S	27500	12649	V	DVB-S	27500
9	HISPASAT	30.0	W	11577	V	DVB-S	27500	11931	H	DVB-S	27500	11731	H	DVB-S	28126	12456	V	DVB-S	30000

- A library setup file contains 1000 setups (see Library setups)

	Nom du programme Setup name	Nom du site Place name	Fréquence Frequency	N° de canal Channel #	Plan de fréquences Frequencies map	Polarisation Polarization	Bande LNB LNB band	Standard	Mode audio Audio mode	Constellation	Largeur de bande Bandwidth	Débit symbole Symbol rate	Intervalle de garde Guard interval	Inversion du spectre Spectrum inversion
0	DIGITAL+	ASTRA 1	10729,000			V		DVB-S2				22000		
1	ARD	ASTRA 1	10743,000			H		DVB-S				22000		
2	SKY D	ASTRA 1	10773,000			H		DVB-S2				22000		
3	DIGITAL+	ASTRA 1	10788,000			V		DVB-S				22000		
4	DIGITAL+	ASTRA 1	10817,000			V		DVB-S2				22000		
5	ANIXE HD	ASTRA 1	10832,000			H		DVB-S2				22000		
6	DIGITAL+	ASTRA 1	10847,000			V		DVB-S				22000		
7	TVP HD	ASTRA 1	10861,000			H		DVB-S				22000		
8	DIGITAL+	ASTRA 1	10876,000			V		DVB-S				22000		
9	UPC	ASTRA 1	10920,000			H		DVB-S				22000		
10	DIGITAL+	ASTRA 1	10979,000			V		DVB-S				22000		
11	SKY D	ASTRA 1	11023,000			H		DVB-S2				22000		
12	DIGITAL+	ASTRA 1	11038,000			V		DVB-S				22000		
13	DIGITAL+	ASTRA 1	11097,000			V		DVB-S				22000		
14	DIGITAL+	ASTRA 1	11156,000			V		DVB-S				22000		
15	ORANGE	ASTRA 1	11170,000			H		DVB-S2				22000		
16	ORF	ASTRA 1	11302,000			H		DVB-S2				22000		
17	DIGITAL+	ASTRA 1	11317,000			V		DVB-S				22000		
18	DASERSTE	ASTRA 1	11361,000			H		DVB-S2				22000		
19	DIGITAL+	ASTRA 1	11435,000			V		DVB-S2				22000		
20	HD+	ASTRA 1	11464,000			H		DVB-S2				22000		
21	CANALSAT	ASTRA 1	11479,000			V		DVB-S				22000		
22	GLOBECAS	ASTRA 1	11508,000			V		DVB-S				22000		
23	GLOBECAS	ASTRA 1	11538,000			V		DVB-S				22000		
24	CANALSAT	ASTRA 1	11567,000			V		DVB-S2				22000		
25	ASTRA	ASTRA 1	11597,000			V		DVB-S				22000		
26	DIGITAL+	ASTRA 1	11626,000			V		DVB-S2				22000		
27	UPC	ASTRA 1	11670,000			H		DVB-S				22000		

- Twenty files of measurement lists, fifty lines each (see Measurement lists)

	A	B	C	D	E	F	G	H	I
1	Nom de la liste / List name	ASTRA1+HOT							
2	Fréquence OL1 / LO1 frequency	9750							
3	Fréquence OL2 / LO2 frequency	10600							
4	Sélection OL / LO setup	DiSEqC							
5	Sélection polarisation / Polarization setup	DiSEqC							
6	Positionneur / Positioner								
7									
8		Numéro de programme Setup number	Switch committed Committed switch	Position Switch committed Committed switch position	Switch uncommited Uncommitted switch	Position switch uncommited Uncommitted switch position	Activation SatCR SatCR enabled	Numéro de slot Slot number	Switch SatCR SatCR switch
9	0								
10	1	1	DiSEqC	Pos A					
11	2	2	DiSEqC	Pos A					
12	3	3	DiSEqC	Pos A					
13	4	4	DiSEqC	Pos A					
14	5	5	DiSEqC	Pos A					
15	6	6	DiSEqC	Pos A					
16	7	7	DiSEqC	Pos A					
17	8	8	DiSEqC	Pos A					
18	9	9	DiSEqC	Pos A					
19	10	10	DiSEqC	Pos A					
20	11	11	DiSEqC	Pos A					
21	12								
22	13	18	DiSEqC	Pos B					
23	14	19	DiSEqC	Pos B					
24	15	20	DiSEqC	Pos B					
25	16	21	DiSEqC	Pos B					
26	17	22	DiSEqC	Pos B					
27	18	23	DiSEqC	Pos B					
28	19	24	DiSEqC	Pos B					
29	20	25	DiSEqC	Pos B					

Prog Lst00 Lst01 Lst02 Lst03 Lst04 Lst05 Lst06 Lst07 Lst08 Lst09 Lst10 Lst11 Lst12 Lst13 Lst14 Lst15 Lst16 Lst17 Lst18 Lst19

Prêt Moyenne : 10175 Nb (non vides) : 4 Somme : 20350 100 %

These files correspond with the tabs of the Sat.xls files (for the plotting), SConf.xls (SPAROS SAT HD), SCConf.xls (SPAROS SAT HD DVB-C) and STConf.xls (SPAROS SAT HD DVB-T). These files are avaiable on the included USB stick. Or send an e-mail to hotline@spaun.de

The appliance is not directly compatible with these files. Anyway, you must save each tab as a CSV file (text file in columns separated with semicolons):

- One file S**at.csv** for the plotting
- One file SP**rog.csv, SCProg.csv** or **STProg.csv** for the setups
- Files SL**st00.csv, SLst01.csv, SLst02.csv…SLst00.csv…** for each measurement list.

There is a CSV macro-command that does it all: Ctrl + Shift + C on keyboard. (Office 2007 2010 only)

These CSV files must be copied to the root directory of an USB key.

Then, the USB key must be connected to the appliance.

Eventually, you only have to validate the transfer with the Validation key on the Config.<-> USB line.

During the transfer, the previous configuration of the appliance will be saved into the Conf directory:

- One file S**at.csv** for the plotting

- One file TP**rog.csv** for the setups
- Twenty files TL**st00.csv, TLst01.csv, TLst02.csv**…

	Satellite files for SPAROS SAT HD have names beginning with S. Satellite + cable files for SPAROS SAT HD DVB-C have names beginning with SC. Satellite + terrestrial files for SPAROS SAT HD DVB-T have names beginning with ST.

	If there is no CSV file on the USB key, only the previous configuration of the appliance will be saved.

	You don't need to copy all the files into the USB key. ex.: if only the memory list #5 has changed, you only have to copy SLst05.csv.

	You can open the old CSV files with spreadsheet software. You can copy and paste values with the corresponding XLS.

	You can move the old CSV files from the Conf directory to the home directory of the USB key to transfer the configuration from an appliance to another.

16.8 Filling library setups with ini file

There is also an INI macro-command: Ctrl + Shift + I to insert setups to a selected cell from an ini file

When the macro command is executed, a Windows Explorer window opens and allows the selected file to import. Just click on the file you want to immediately incorporate into the setup library.

What is an « *.ini » file?

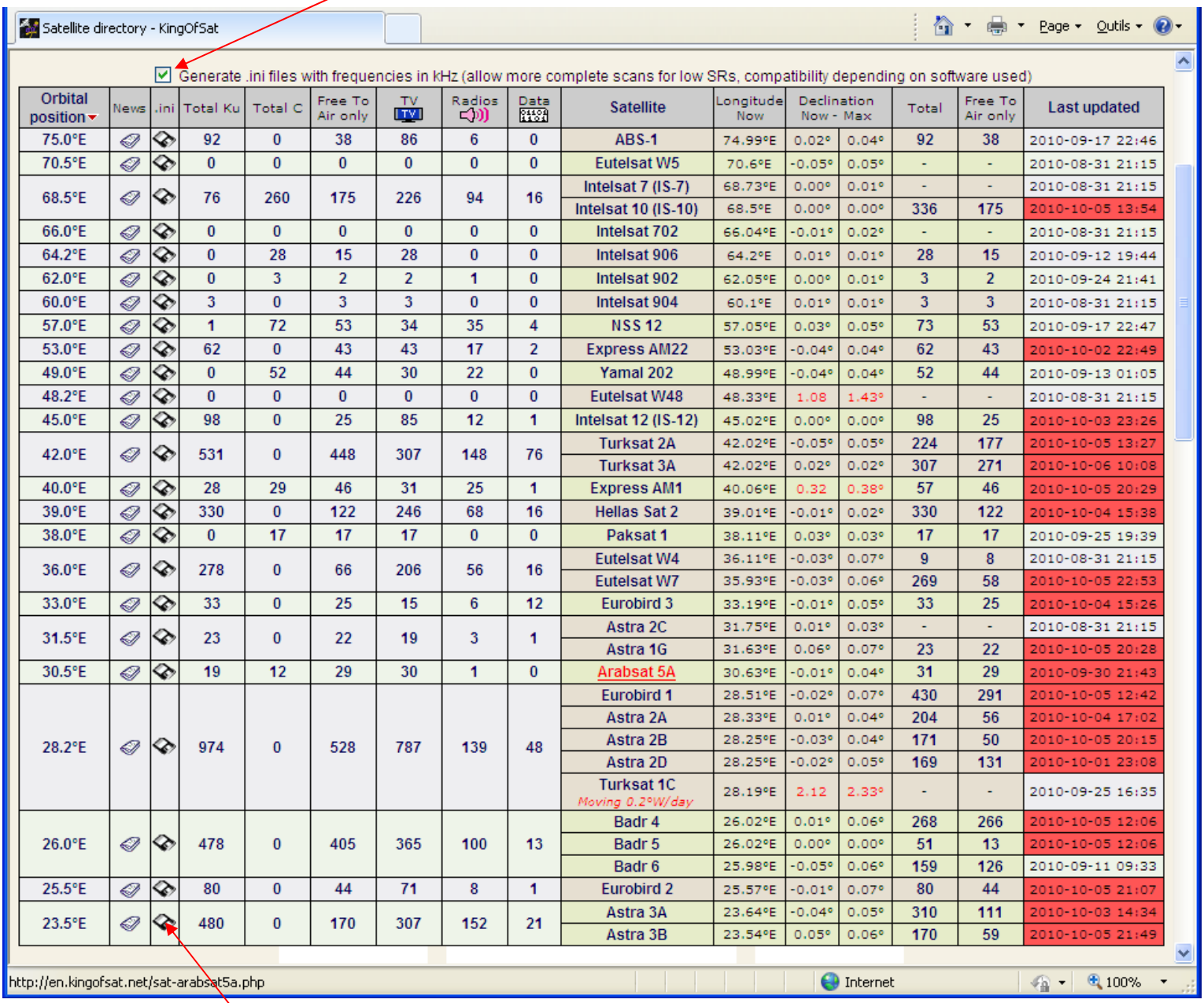
An « *.ini » file contains satellite's parameters in ACII format.

These files are available:

- on King of Sat website http://en.kingofsat.net/satellites.php for satellite

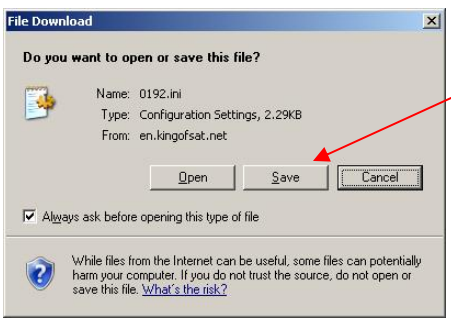
European satellite « *.ini » files can be downloaded. These files are updated regularly: So it's advised to go on this website to get the latest information.

It's advised to fill this tick box to get a better accuracy of the frequencies


Satellite directory - KingOfSat
Page
Outils
Generate .ini files with frequencies in kHz (allow more complete scans for low SRs, compatibility depending on software used)
http://en.kingofsat.net/sat-arabsat5a.php
Internet
100%

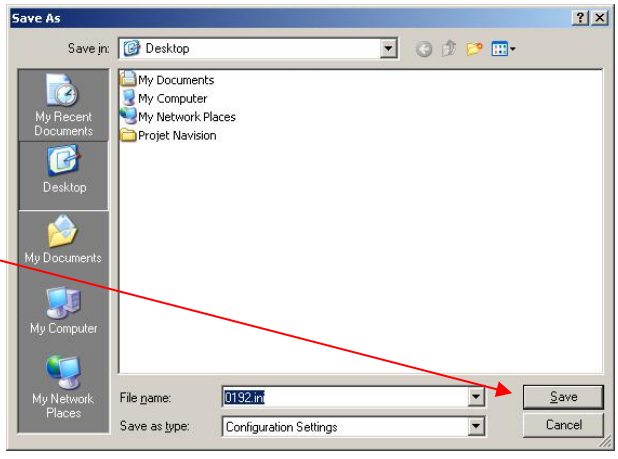
Orbital position	News	.ini	Total Ku	Total C	Free To Air only	TV	Radios	Data	Satellite	Longitude Now	Declination Now	Declination Max	Total	Free To Air only	Last updated
75.0°E			92	0	38	86	6	0	ABS-1	74.99°E	0.02°	0.04°	92	38	2010-09-17 22:46
70.5°E			0	0	0	0	0	0	Eutelsat W5	70.6°E	-0.05°	0.05°	-	-	2010-08-31 21:15
68.5°E			76	260	175	226	94	16	Intelsat 7 (IS-7)	68.73°E	0.00°	0.01°	-	-	2010-08-31 21:15
									Intelsat 10 (IS-10)	68.5°E	0.00°	0.00°	336	175	2010-10-05 13:54
66.0°E			0	0	0	0	0	0	Intelsat 702	66.04°E	-0.01°	0.02°	-	-	2010-08-31 21:15
64.2°E			0	28	15	28	0	0	Intelsat 906	64.2°E	0.01°	0.01°	28	15	2010-09-12 19:44
62.0°E			0	3	2	2	1	0	Intelsat 902	62.05°E	0.00°	0.01°	3	2	2010-09-24 21:41
60.0°E			3	0	3	3	0	0	Intelsat 904	60.1°E	0.01°	0.01°	3	3	2010-08-31 21:15
57.0°E			1	72	53	34	35	4	NSS 12	57.05°E	0.03°	0.05°	73	53	2010-09-17 22:47
53.0°E			62	0	43	43	17	2	Express AM22	53.03°E	-0.04°	0.04°	62	43	2010-10-02 22:49
49.0°E			0	52	44	30	22	0	Yamal 202	48.99°E	-0.04°	0.04°	52	44	2010-09-13 01:05
48.2°E			0	0	0	0	0	0	Eutelsat W48	48.33°E	1.08	1.43°	-	-	2010-08-31 21:15
45.0°E			98	0	25	85	12	1	Intelsat 12 (IS-12)	45.02°E	0.00°	0.00°	98	25	2010-10-03 23:26
42.0°E			531	0	448	307	148	76	Turksat 2A	42.02°E	-0.05°	0.05°	224	177	2010-10-05 13:27
									Turksat 3A	42.02°E	0.02°	0.02°	307	271	2010-10-06 10:08
40.0°E			28	29	46	31	25	1	Express AM1	40.06°E	0.32	0.38°	57	46	2010-10-05 20:29
39.0°E			330	0	122	246	68	16	Hellas Sat 2	39.01°E	-0.01°	0.02°	330	122	2010-10-04 15:38
38.0°E			0	17	17	17	0	0	Paksat 1	38.11°E	0.03°	0.03°	17	17	2010-09-25 19:39
36.0°E			278	0	66	206	56	16	Eutelsat W4	36.11°E	-0.03°	0.07°	9	8	2010-08-31 21:15
									Eutelsat W7	35.93°E	-0.03°	0.06°	269	58	2010-10-05 22:53
33.0°E			33	0	25	15	6	12	Eurobird 3	33.19°E	-0.01°	0.05°	33	25	2010-10-04 15:26
31.5°E			23	0	22	19	3	1	Astra 2C	31.75°E	0.01°	0.03°	-	-	2010-08-31 21:15
									Astra 1G	31.63°E	0.06°	0.07°	23	22	2010-10-05 20:28
30.5°E			19	12	29	30	1	0	Arabsat 5A	30.63°E	-0.01°	0.04°	31	29	2010-09-30 21:43
28.2°E			974	0	528	787	139	48	Eurobird 1	28.51°E	-0.02°	0.07°	430	291	2010-10-05 12:42
									Astra 2A	28.33°E	0.01°	0.04°	204	56	2010-10-04 17:02
									Astra 2B	28.25°E	-0.03°	0.04°	171	50	2010-10-05 20:15
									Astra 2D	28.25°E	-0.02°	0.05°	169	131	2010-10-01 23:08
									Turksat 1C *Moving 0.2°W/day*	28.19°E	2.12	2.33°	-	-	2010-09-25 16:35
26.0°E			478	0	405	365	100	13	Badr 4	26.02°E	0.01°	0.06°	268	266	2010-10-05 12:06
									Badr 5	26.02°E	0.00°	0.00°	51	13	2010-10-05 12:06
									Badr 6	25.98°E	-0.05°	0.06°	159	126	2010-09-11 09:33
25.5°E			80	0	44	71	8	1	Eurobird 2	25.57°E	-0.01°	0.07°	80	44	2010-10-05 21:07
23.5°E			480	0	170	307	152	21	Astra 3A	23.64°E	-0.04°	0.05°	310	111	2010-10-03 14:34
									Astra 3B	23.54°E	0.05°	0.06°	170	59	2010-10-05 21:49

For example, to download Astra 235°E « *.ini » file, click here.


File Download
Do you want to open or save this file?
Name: 0192.ini
Type: Configuration Settings, 2.29KB
From: en.kingofsat.net
Open
Save
Cancel
Always ask before opening this type of file
While files from the Internet can be useful, some files can potentially harm your computer. If you do not trust the source, do not open or save this file. What's the risk?

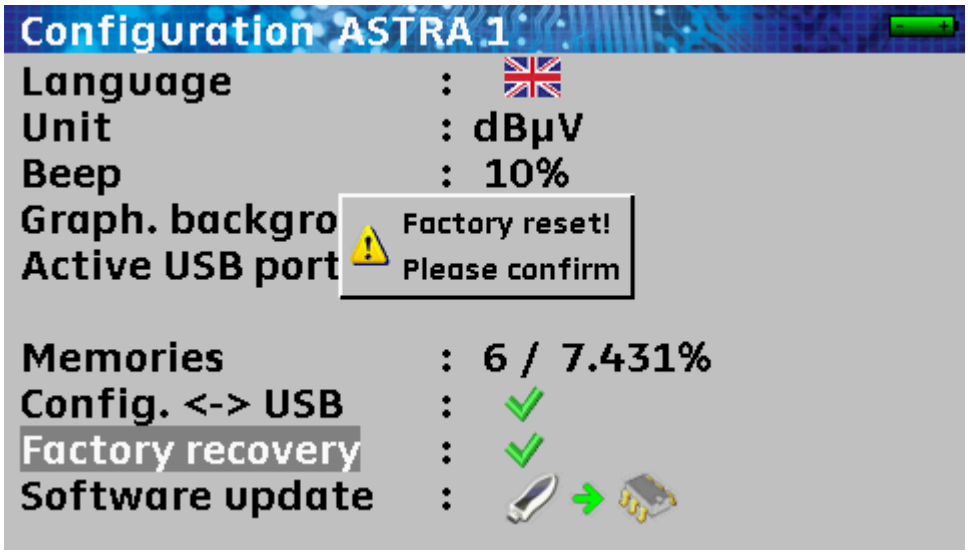
Then click on « *Save* ».

Select the destination directory and then, click on « *Save* ».



16.9 Factory reset

Complete reset of the appliance under default factory configuration with confirmation.



	Factory recovery erase : - The library of setups - The lists of measurements

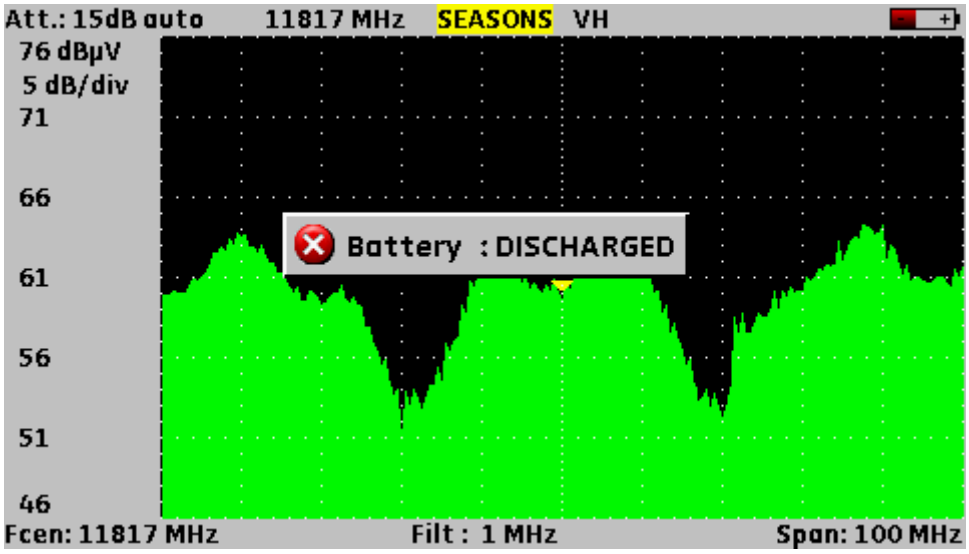
16.10 Update

Update of the software of the appliance with a USB key.
See the paragraph Updating the software for more details.

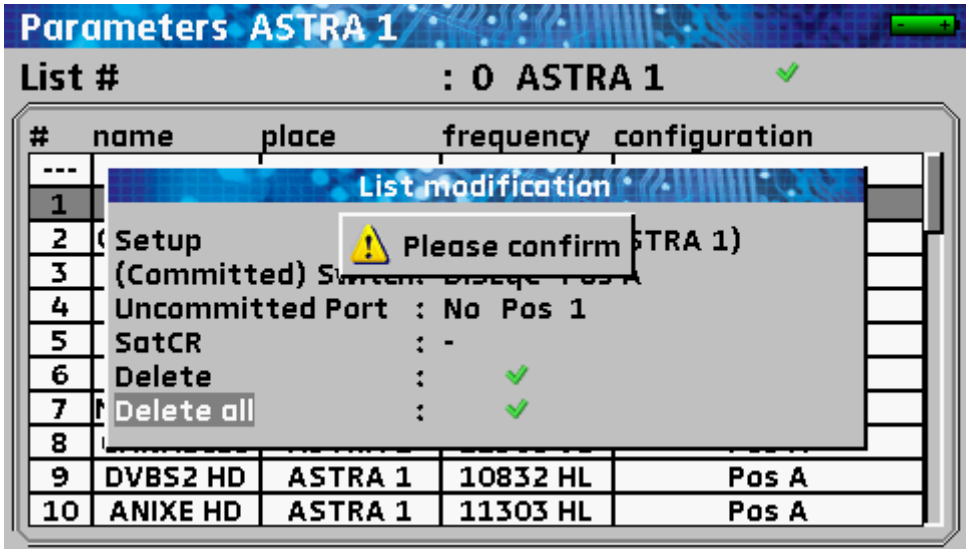
17 Displayed messages

The appliance can display messages while running.

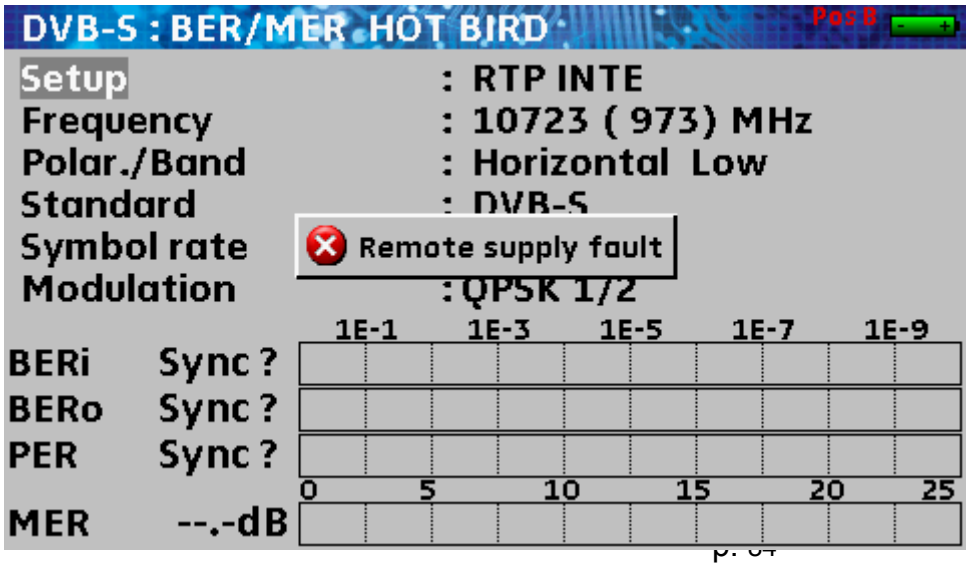
17.1 Alert messages



The battery is running out of power: the appliance will shut down in a few minutes.

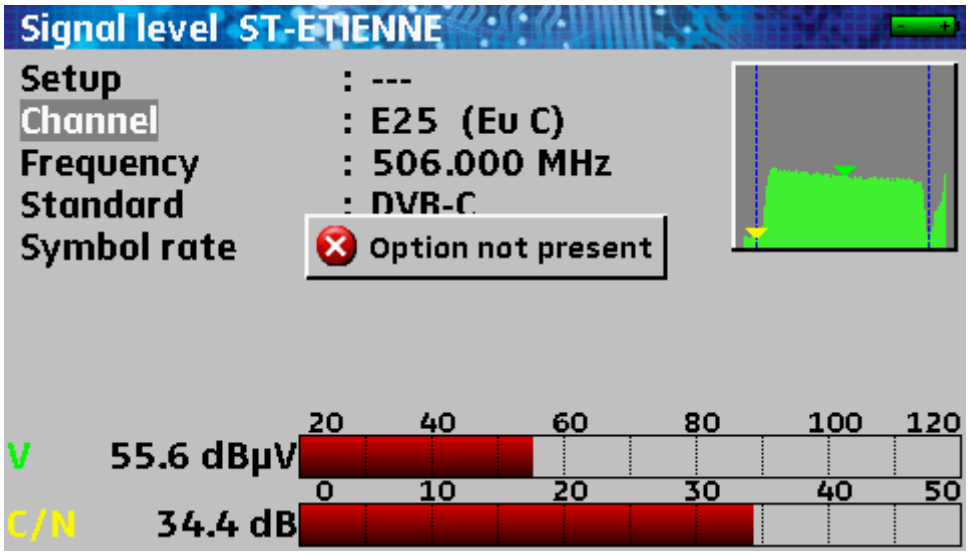

Parameters ASTRA 1
List # : 0 ASTRA 1
name place frequency configuration
List modification
Please confirm
Setup
(Committed)
Uncommitted Port : No Pos 1
SatCR : -
Delete :
Delete all :
9 DVBS2 HD ASTRA 1 10832 HL Pos A
10 ANIXE HD ASTRA 1 11303 HL Pos A

Confirmation request for some important action.

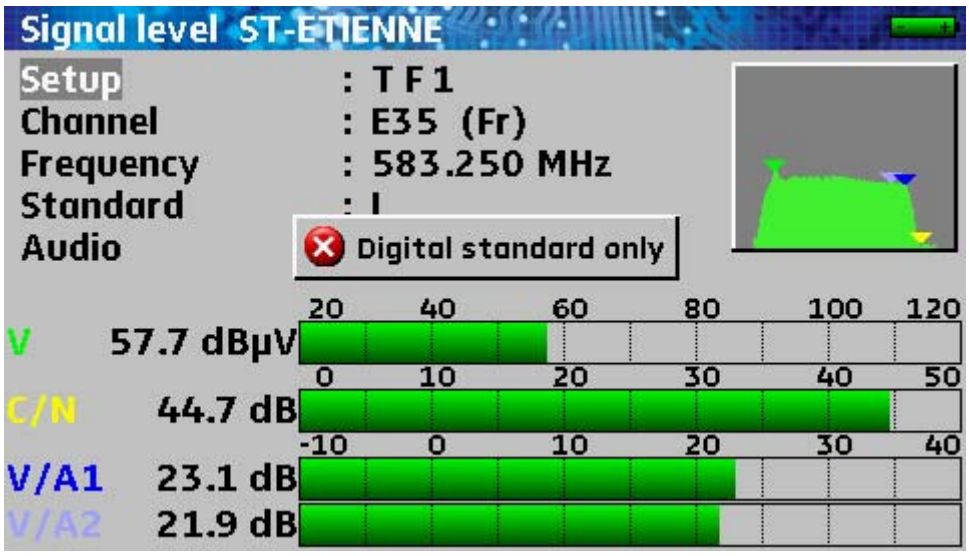


Fault of the remote supply: there is voltage on the cable or the max. authorized current has been exceeded.

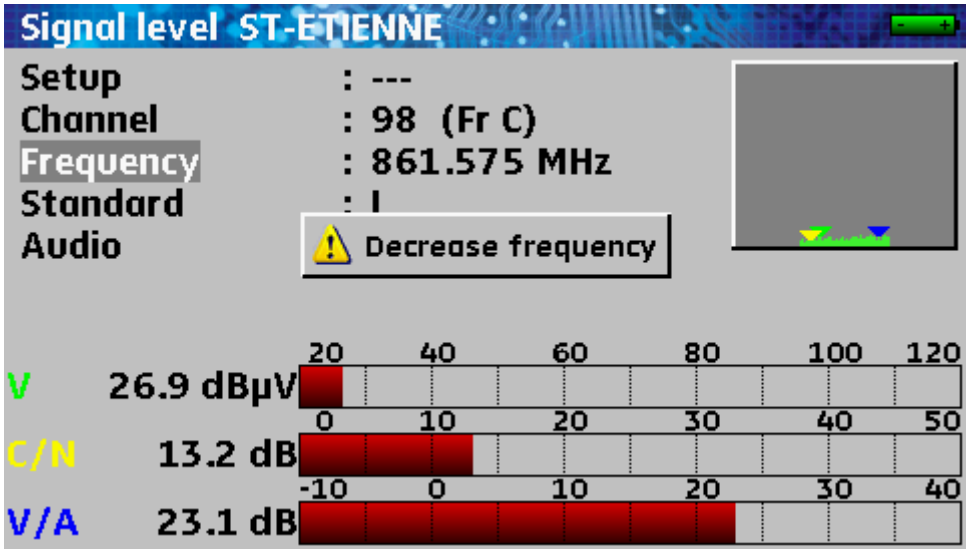
17.2 Impossibility messages



No DVB-C decoder on SPAROS SAT HD, thus no TV image



No analogical TV image



The appliance is trying to make a level measurement out of range (ex.: V/A measurement with a video carrier wave beyond channel 69)

17.3 Error messages

Message at the bottom of the screen.

It may appear after updating the software, else:
Contact the SPAUN technical support:

Tel.: +49 7731 8673-83

E-mail: hotline@spaun.de

18 Technical data

18.1 Common technical characteristics

Frequency:

Ranges:	5MHz to 865MHz 950MHz to 2150MHz	SPAROS SAT HD DVB-C
	45MHz to 865MHz 950MHz to 2150MHz	SPAROS SAT HD DVB-T
	45MHz to 865MHz 950MHz to 2150MHz	
Resolution:	terrestrial: 50 kHz in measurement satellite: 1MHz in measurement	

Level measurement:

Frequencies	5-45MHz	45-865MHz	950-2150MHz
Dynamics	25-120dBµV	20-120dBµV	40-110 dBµV (120 dBµV typical)
Accuracy @ 23°C ±5°C	± 1dB typical ± 2dB max.	± 1dB typical ± 2dB max.	± 1dB typical ± 2dB max.
Accuracy from -5°C to +45°C	± 4dB max.	± 4dB max.	± 4dB max.

Units:	dBµV, dBmV, dBm or Volt
Resolution:	0.1dB
Measurement filters:	terrestrial 300 kHz satellite 1MHz
Input:	75Ω BNC
Max. allowable level:	80VDC, 48Vrms / 50Hz
Standards:	terrestrial B, G, D, K, I, L, M, N, FM, DVB-T/H, DVB-C, MCNS satellite PAL, SECAM, NTSC, DVB-S2, DVB-S, DSS
Measurements:	peak, average or effective power
Display:	digital and bar graphs

Spectrum analysis:

Filters:	terrestrial 300 kHz satellite 1MHz
Attenuator:	0 to 60dB (in 10dB-steps)
Dynamics (display):	60dB
Span:	0, 5, 10, 20, 50, 100, 200, 500, 1000MHz and full
Number of dots:	400

Scan speed:	terrestrial 150ms
	satellite 350ms

Measurement plan (data logger):

Capacity:	polling max. 50 setups
Display:	digital
Measurements:	level/power, C/N and error rates
	threshold detection

Memorization:

Saving:	internal on flash memory
Data:	frequency plans, measurements, spectrums, measurement plans, constellations, echoes
Capacity:	312 kBytes, max. 1000 files

Auxiliary inputs and outputs:

USB interface:	USB A and USB mini B
Input power supply:	jack 5.5mm, 15V max., 1A

18.2 DVB-C (SPAROS SAT HD DVB-C)

According to UIT-J.83 APPENDIX A

Frequency:	45MHz to 865MHz
Error rate:	before Reed Solomon (BERo)
	after Reed Solomon (PER) (lost packets)
Modulation error rate:	20 to 40dB (MER)
Rate:	1 to 7.224Ms/s
Constellation:	16, 32, 64, 128, 256

Graphical display of constellation.

18.3 MCNS (SPAROS SAT HD DVB-C)

According to UIT-J.83 APPENDIX B

IDEM DVB-C except:

Constellation:	64, 256
Rate:	1 to 5.563Ms/s

Graphical display of constellation.

18.4 DVB-S, DSS (each SPAROS SAT HD model)

According to ETS 300-421

Frequencies:	950MHz to 2150MHz

Error rate:	before Viterbi (BERi)
	after Viterbi (BERo)
	after Reed Solomon (PER) (lost packets)
Modulation error rate:	0 to 20dB (MER)
Rate:	1 to 45 Ms/s
Modulation:	QPSK
Viterbi rate:	1/2, 2/3, 3/4, 5/6, 6/7, 7/8 (automatic)

Graphical display of constellation.

18.5 DVB-S2 (each SPAROS SAT HD model)

Following ETS 302-307

Frequencies:	950MHz to 2150MHz
Error rate:	before LDPC (BERi)
	after LDPC (BERo)
	after BCH (PER) (lost packets)
Modulation error rate:	0 to 20dB (MER)
Rate:	QPSK 1 to 45Ms/s, 8PSK 1 to 45Ms/s
Modulation:	QPSK, 8PSK (automatic)
Punctuation:	QPSK: 1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 8/9, 9/10 (automatic)
	8PSK: 3/5, 2/3, 3/4, 5/6, 8/9, 9/10 (automatic)

Graphical display of constellation.

18.6 DVB-T/H (SPAROS SAT HD DVB-T)

According to ETS 301-701

Frequencies:	45MHz to 865MHz
AFC:	± 167 kHz, ± 333 kHz, ± 500 kHz
Error rate:	before Viterbi (BERi)
	after Viterbi (BERo)
	after Reed Solomon (PER) (lost packets)
Modulation error rate:	0 to 35dB (MER)
Bandwidth:	5, 6, 7 or 8MHz
Carrier waves:	2k / 8k (automatic)
Constellation:	16QAM, 64QAM, QPSK (automatic)
Viterbi rate:	1/2, 2/3, 3/4, 5/6, 7/8 (automatic)

Graphical display of constellation.
Graphical display of echoes.

18.7 Demodulation image and sound

Audio:	digital TV sound AAC, HE-AAC, Dolby Digital, Dolby Digital Plus
Video:	digital TV image MPEG2, MPEG4 576i, 720p, unencrypted 1080i

18.8 Remote supply

Voltage:	5V, 13V, 18V and 24V
Current:	500mA max, 300mA max under 24V short-cut protection
Mini DiSEqC:	22 kHz ± 2 kHz, 0.6V peak to peak ± 0.1V
DiSEqC generator:	standard 1.2, motorized dish, committed and uncommitted switches
SatCR:	extension of protocol DiSEqC, 8 slots maximum

18.9 Power supply - Battery

External power supply:	mains block 100/240VAC, cable according to the country, jack 5.5mm, hole 2.1mm output 15V 1A max.
Non-removable battery:	Lithium-Ion 10.8V, 2.25 A.h (9V at the end of loading)
Autonomy:	approx. 2h after complete loading (2h15 with shut-off appliance)

18.10 Environment

Screen:	TFT colour 4.3 in. (16/9), back-lighted
Operating temperature:	-5°C to +45°C
Storing temperature:	-10°C to +60°C
CEM and security:	conformity CE NF-EN 61326 July 1997 + A1 October 98 + A2 edit September 2001 EN 55022 A2 version 2003 class B for autonomous appliance Immunity according to EN 61326-1 2006 NF-EN 61010-1 June 2001
Dimensions and weight:	ca. 192 x 200 x 102 1.5kg (battery included)

18.11 Equivalence between V, dBµV, dBmV and dBm

dBµV (dBmV) is the logarithmic ratio between a measured voltage U_d and a reference voltage U_r.

The reference voltage is U_r = 1µV (1mV)

$N = 20 \log (U_d/U_r)$

dBm is the logarithmic ratio between a measured power P_d and a reference power P_r.

The reference power is P_r = 1mW @ 75Ω

$N = 10 \log (P_d / P_r)$ with $P_d = Ud^2 / 75$

U_d = 1µV	N = 0dBµV	N = -60dBmV	N = -108.75dBm
U_d = 1mV	N = 60dBµV	N = 0dBmV	N = -48.75dBm
U_d = 1V	N = 120dBµV	N = 60dBmV	N = 11.25dBm

18.12 Values to measure

Minimum and maximum values for a good quality of signal.

Measurements	Level, power (dBµV)		C/N (dB)	BER	MER (dB)	modulation
	mini	maxi				
Terrestrial						
Analogical TV	57	74	> 45	-	-	-
FM	50	66	> 38	-	-	-
DVB-T	35	70	> 26	BERo < 2^E-4	> 26	8K, 64QAM, 1/32, 2/3
DVB-C, MCNS	57	74	> 31	BERo < 2^E-4	> 31	64QAM
Satellite						
Analogical TV	47	77	> 15	-	-	-
DVB-S, DSS	47	77	> 11	BERo < 2^E-4	> 11	QPSK, 3/4
DVB-S2	47	77	> 8	PER < 1^E-7	> 8	8PSK, 2/3